

YB 17341

905

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| | (1. * 1 | |

A special feature of the Tables of the Circular Functions is the prominence given to the true scientific unit of angle—namely, the Radian. The pupil cannot be introduced too soon to this conception; and most of the Tables included in Parts III. and V. give the angles in both the natural and conventional units. Table V., which, so far as the compiler knows, is now (1905) published, for the first time, will be found of great service in graphical construction and in the graphical solution of equations involving the circular functions.

1.16732

.01437

1.84702

1.18298

USEFUL NUMBERS WITH THEIR LOGARITHMS

| USEFUL NUM | BERS WITH | THEIR LOGARITH | MS. |
|---|----------------------------|--|---|
| | METRIC S | YSTEM. | |
| | Log. | | Log. |
| 1 metre = 39.370113 in. | 1.59517 | 1 in. = 2.54 cm. | ·40483 |
| = 3·280843 ft. | *51599 | 1 ft. = 30.48 cm. | 1.48401 |
| = 1.0936 yd. | *03886 | 1 yd. = 0.9144 m. | 7.96114 |
| 1 Km. = 0.62137 ml. | 1.79335 | 1 ml. = 1.6093 Km. | 20665 |
| | | | 2000 |
| 1 (m.) ² =10.7639 (ft.) ² | 1.03197 | $1 \text{ (in.)}^2 = 6.4516 \text{ (cm.)}^2$ | *80967 |
| = 1.196 (yd.)2 | .07773 | $1 \text{ (yd.)}^2 = 0.8361 \text{ (m.)}^2$ | 1.92227 |
| $1 (Km.)^2 = 0.3861 (ml.)^2$ | 1.58670 | $1 \text{ (ml.)}^2 = 2.59 \text{ (Km.)}^2$ | *41330 |
| | | | 1 |
| 1 hectare = 2.4716 acres | 39298 | 1 acre = 0.4046 hectare | 1.60702 |
| $1 \text{ (m.)}^3 = 1.308 \text{ (yd.)}^3$ | ·11659 | $1 \text{ (yd.)}^3 = 0.7646 \text{ (m.)}^3$ | 1.88341 |
| | | | |
| 1 litre = 61.0238 (in.)3 | 1.78550 | $1 \text{ (in.)}^3 = 16.387 \text{ (cm.)}^3$ | 1.21450 |
| = 1.76 pint | •24546 | 1 pint = 0.568 l. | 1.75454 |
| = 0 22 gallon | 1.34237 | 1 gallen = 4.546 l. | 65763 |
| | | | |
| 1 gram =15.43236 gr. | 1.18843 | 1 gr. = 0.0648 g. | 2.81157 |
| 1 Kg. = 2.20462 lb. | *34333 | 1 lb. = 0.4536 Kg. | 1.65667 |
| MAT $\pi = 3.14159265=3.$ $180/\tau = 57^{\circ}.2958=57^{\circ}.17'$ $\pi/2 = 1.5708$ $4\pi/3 = 4.1888$ $1/\pi = 0.3183$ | 1416 or 22/7 nearly | | Log. •49715 1•75812 •99430 1•75143 1•79264 |
| $\pi/180 = 0.017453$ | 2.24188 | $\sqrt[3]{6/\pi} = 1.24070$ | .09367 |
| | 43429 or exp. (2.3025 | | *68219 |
| | | | |
| DYI | NAMICAL CO | ONSTANTS. | |
| | Log. | | Log. |
| g = 32·2 ft./(sec.) ² | 1.50786 | g = 981 cm./(sec.) ² | 2.99167 |
| 1 lbwt. = 4.45×10^5 dynes | 5.64836 | 106 dynes = 2.247 lbwt. | *35164 |
| 1 ftlb. = 0.1383 Kgm. | Ī·14078 | 1 Kgm. = 7:231 ftlb. | *85922 |
| $= 1.356 \times 10^7 \text{ ergs}$ | 7:13245 | $10^8 \text{ ergs} = 7.371 \text{ ftlb.}$ | *86755 |
| | | 3 | 00,00 |
| 1 atmosphere of p | ressure = 1:014 | ×108 dynes/(cm.)2 | 6.00604 |

-000000000

1 lb.-wt./(in.)2 = 70.31 gram-wt./(cm.)2

1 Kg.-wt./(cm.) $^2 = 14.223$ lb.-wt./(in.) 2

A

= 14.7 lb.-wt./(in.)2

= 1.034 Kg.-wt./(cm.)2

| | | | | - | | | | | | | | | Mea | an I | Diff | erei | nces | 3. | |
|----------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|-----------------------|----------------------------|----------------------|-----------------------|----------------------------|-----------------------|----------------------------|-----------------------|----------------------------|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9. |
| 10 11 12 13 | 0000 0414 0792 1139 | 0043 0453 0828 1173 | 0086 0492 0864 1206 | 0128 0531 0899 1239 | 0170 0569 0934 1271 | 0212 0607 0969 1303 | 0253 0645 1004 1335 | 0294 0682 1038 1367 | 0334 0719 1072 1399 | 0374 0755 1106 1430 | 4 4 3 3 | 8 8 7 6 | 12 11 10 10 | 15 14 | 21 19 17 16 | 23 21 | 26 24 | 33 30 28 26 | 37 34 31 29 |
| 14 15 | 1461 1761 | 1492 1790 | 1523 1818 | 1553 1847 | 1584 1875 | 1614 1903 | 1644 1931 | 1673 1959 | 1703 1987 | 1732 2014 | 3 3 | 6 | 9 8 | 12 | 15 14 | 18 | 21 | 24 | 27 |
| 16 17 18 19 20 | 2041 2304 2553 2788 3010 | 2068 2330 2577 2810 3032 | 2095 2355 2601 2833 3054 | 2122 2380 2625 2856 3075 | 2148 2405 2648 2878 3096 | 2175 2430 2672 2900 3118 | 2201 2455 2695 2923 3139 | 2227 2480 2718 2945 3160 | 2253 2504 2742 2967 3181 | 2279 2529 2765 2989 3201 | 3 2 2 2 2 | 5 5 4 4 | 8 7 7 6 | 10 9 9 | 13 12 12 11 11 | 15 14 13 | 18 17 16 16 15 | $\frac{20}{19}$ 18 | 24 22 21 20 19 |
| 21 22 23 24 25 | 3222 3424 3617 3802 3979 | 3243 3444 3636 3820 3997 | 3263 3464 3655 3838 4014 | 3284 3483 3674 3856 4031 | 3304 3502 3692 3874 4048 | 3324 3522 3711 3892 4065 | 3345 3541 3729 3909 4082 | 3365 3560 3747 3927 4099 | 3385 3579 3766 3945 4116 | 3404 3598 3784 3962 4133 | 2 2 2 2 | 4 4 4 3 | 6 6 5 5 | 8 8 7 7 | | | 14 13 12 | | 17 17 |
| 26 27 28 29 30 | 4150 4314 4472 4624 4771 | 4166 4330 4487 4639 4786 | 4183 4346 4502 4654 4800 | 4200 4362 4518 4669 4814 | 4216 4378 4533 4683 4829 | 4232 4393 4548 4698 4843 | 4249 4409 4564 4713 4857 | 4265 4425 4579 4728 4871 | 4281 4440 4594 4742 4886 | 4298 4456 4609 4757 4900 | 2 2 1 1 | 3 3 3 3 3 | 5 5 4 4 | 7 6 6 6 6 | 8 8 8 7 7 | 10 9 9 9 | 11 11 11 10 10 | 13 12 12 | |
| 31 32 33 34 35 | 4914 5051 5185 5315 5441 | 4928 5065 5198 5328 5453 | 4942 5079 5211 5340 5465 | 4955 5092 5224 5353 5478 | 4969 5105 5237 5366 5490 | 4983 5119 5250 5378 5502 | 4997 5132 5263 5391 5514 | 5011 5145 5276 5403 5527 | 5024 5159 5289 5416 5539 | 5038 5172 5302 5428 5551 | 1 1 1 1 | 3 3 3 2 | 4 4 4 4 | 6 5 5 5 5 | 7 7 6 6 6 | 8 8 8 7 | 9 | 11 | 12 12 11 |
| 36 37 38 39 40 | 5563 5682 5798 5911 6021 | 5575 5694 5809 5922 6031 | 5587 5705 5821 5933 6042 | 5599 5717 5832 5944 6053 | 5611 5729 5843 5955 6064 | 5623 5740 5855 5966 6075 | 5635 5752 5866 5977 6085 | 5647 5763 5877 5988 6096 | 5658 5775 5888 5999 6107 | 5670 5786 5899 6010 6117 | 1 1 1 1 1 | 2 2 2 2 2 | 3 3 3 3 | 5 5 5 4 4 | 6 6 6 5 5 | 7 7 7 7 6 | 88888 | | 11 10 10 10 10 |
| 41 42 43 44 45 | 6128 6232 6335 6435 6532 | 6138 6243 6345 6444 6542 | 6149 6253 6355 6454 6551 | 6160 6263 6365 6464 6561 | 6170 6274 6375 6474 6571 | 6180 6284 6385 6484 6580 | 6191 6294 6395 6493 6590 | 6201 6304 6405 6503 6599 | 6212 6314 6415 6513 6609 | 6222 6325 6425 6522 6618 | 1 1 1 1 | 2 2 2 2 2 2 | 3 3 3 3 3 3 | 4 4 4 4 4 | 5 5 5 5 5 | 6 6 6 6 | 77777 | 8 8 8 8 8 | 9 9 9 9 |
| 46 47 48 49 50 | 6628 6721 6312 6902 6990 | 6637 6730 6821 6911 6998 | 6646 6739 6830 6920 7007 | 6656 6749 6839 6928 7016 | 6665 6758 6848 6937 7024 | 6675 6767 6857 6946 7033 | 6684 6776 6866 6955 7042 | 6693 6785 6875 6964 7050 | 6702 6794 6884 6972 7059 | 6712 6803 6893 6981 7067 | 1 1 1 1 | 2 2 2 2 2 | 3 3 3 3 3 | 4 4 4 3 | 5 5 4 4 4 | 6 5 5 5 5 | 7 6 6 6 6 | 7 7 7 7 | 8 8 8 8 |
| 51 52 53 54 55 | 7076 7160 7243 7324 7404 | 7084 7168 7251 7332 7412 | 7093 7177 7259 7340 7419 | 7101 7185 7267 7348 7427 | 7110 7193 7275 7356 7435 | 7118 7202 7284 7364 7443 | 7126 7210 7292 7372 7451 | 7135 7218 7300 7380 7459 | 7143 7226 7308 7388 7466 | 7152 7235 7316 7396 7474 | 1 1 1 1 | 2 2 2 2 | 3 2 2 2 2 | 3 3 3 3 | 4 4 4 4 | 5 5 5 5 | 6 6 6 5 | 7 7 6 6 6 | 8 7 7 7 |
| 56 57 58 59 60 | 7482 7559 7634 7709 7782 | 7490 7566 7642 7716 7789 | 7497 7574 7649 7723 7796 | 7505 7582 7657 7731 7803 | 7513 7589 7664 7738 7810 | 7520 7597 7672 7745 7818 | 7528 7604 7679 7752 7825 | 7536 7612 7686 7760 7832 | 7543 7619 7694 7767 7839 | 7551 7627 7701 7774 7846 | 1 1 1 1 1 1 | 2 2 1 1 1 | 2 2 2 2 2 | 3 3 3 3 3 | 4 4 4 4 4 | 5 5 4 4 4 | 5 5 5 5 5 5 | 6 6 6 | 7 7 7 6 |

| | | , | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | | M | ear | ı D | iffe | ren | ces | 3. | |
|------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-----|---|-----|-----|------|-----|-----|-----|-------|
| | 0 | 1 | 2 | 3 | 4 | 5 | 0 | | • | 9 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 60 61 | 7782 7853 | 7789 7860 | 7796 7868 | 7803 7875 | 7810 7882 | 7818 7889 | 7825 7896 | 7832 7903 | 7839 7910 | 7846 7917 | 1 | 1 | 2 2 | 3 | 4 | 4 | 5 5 | 6 | 6 |
| 62 | 7924 | 7931 | 7938 | 7945 | 7952 | 7959 | 7966 | 7973 | 7980 | 7987 | 1 | 1 | 2 | 3 | 3 | 4 | 5 | 6 | 6 |
| 63 64 | 7993 8062 | 8000 8069 | 8007 8075 | 8014 8082 | 8021 8089 | 8028 8096 | 8035 8102 | 8041 8109 | 8048 8116 | 8055 8122 | 1 | 1 | 2 2 | 3 | 3 | 4 | 5 | 5 | 6 |
| 65 | 8129 | 8136 | 8142 | 8149 | 8156 | 8162 | 8169 | 8176 | 8182 | 8189 | 1 | 1 | 2 | 3 | 3 | 4 | 5 | 5 | 6 |
| 66 | 8195 | 8202 8267 | 8209 8274 | 8215 8280 | 8222 8287 | 8228 8293 | 8235 8299 | 8241 8306 | 8248 8312 | 8254 8319 | 1 | 1 | 2 2 | 3 | 3 | 4 | 5 | 5 5 | 6 |
| 67 68 | 8261 8325 | 8331 | 8338 | 8344 | 8351 | 8357 | 8363 | 8370 | 8376 | 8382 | 1 | 1 | 2 | 3 | 3 | 4 | 4 | 5 | 6 |
| 69 70 | 8388 8451 | 8395 8457 | 8401 8463 | 8407 8470 | 8414 8476 | 8420 8482 | 8426 8488 | 8432 8494 | 8439 8500 | 8445 8506 | 1 | 1 | 2 2 | 2 2 | 3 | 4 | 4 | 5 | 6 |
| 71 | 8513 | 8519 | 8525 | 8531 | 8537 | 8543 | 8549 | 8555 | 8561 | 8567 | 1 | 1 | 2 | 2 | 3 | 4 | 4 | 5 | 5 |
| 72 | 8573 | 8579 | 8585 | 8591 | 8597 | 8603 | 8609 | 8615 | 8621 | 8627 | 1 | 1 | 2 2 | 2 | 3 | 4 | 4 | 5 | 5 |
| 73 74 | 8633 8692 | 8639 8698 | 8645 8704 | 8651 | 8657 8716 | 8663 8722 | 8669 8727 | 8675 8733 | 8681 8739 | 8686 8745 | 1 | 1 | 2 | 2 2 | 3 | 4 | 4 | 5 | 5 |
| 75 | 8751 | 8756 | 8762 | 8768 | 8774 | 8779 | 8785 | 8791 | 8797 | 8802 | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 5 | 5 |
| 76 77 | 8808 8865 | 8814 8871 | 8820 8876 | 8825 8882 | 8831 8887 | 8837 8893 | 8842 | 8848 8904 | 8854 8910 | 8859 8915 | 1 | 1 | 2 2 | 2 2 | 3 | 3 | 4 | 5 4 | 5 |
| 78 | 8921 | 8927 | 8932 | 8938 | 8943 | 8949 | 8954 | 8960 | 8965 | 8971 | 1 | i | 2 | 2 | 3 | 3 | 4 | 4 | 5 |
| 79 80 | 8976 9031 | 8982 9036 | 8987 9042 | 8993 9047 | 8998 9053 | 9004 9058 | 9009 | 9015 9069 | 9020 9074 | 9025 | 1 1 | 1 | 2 2 | 2 2 | 3 | 3 | 4 | 4 | 52 53 |
| 81 | 9085 | 9090 | 9096 | 9101 | 9106 | 9112 | 9117 | 9122 | 9128 | 9133 | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 | 5 |
| 82 | 9138 | 9143 9196 | 9149 9201 | 9154 9206 | 9159 9212 | 9165 9217 | 9170 | 9175 9227 | 9180 | 9186 9238 | 1 | 1 | 2 2 | 2 2 | 3 | 3 | 4 | 4 | 250 |
| 83 84 | 9191 9243 | 9248 | 9253 | 9258 | 9212 | 9269 | 9222 | 9279 | 9232 9284 | 9289 | 1 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 | 10 |
| 85 | 9294 | 9299 | 9304 | 9309 | 9315 | 9320 | 9325 | 9330 | 9335 | 9340 | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 | 5 |
| 86 87 | 9345 9395 | 9350 9400 | 9355 9405 | 9360 9410 | 9365 9415 | 9370 9420 | 9375 9425 | 9380 9430 | 9385 9435 | 9390 9440 | 1 0 | 1 | 2 | 2 2 | 3 2 | 3 | 4 3 | 4 | 5 |
| 88 | 9445 | 9450 | 9455 | 9460 | 9465 | 9469 | 9474 | 9479 | 9484 | 9489 | 0 | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 |
| 89 90 | 9494 9542 | 9499 9547 | 9504 9552 | 9509 9557 | 9513 9562 | 9518 9566 | 9523 9571 | 9528 | 9533 9581 | 9538 9586 | 0 | 1 | 1 | 2 2 | 2 | 3 | 3 | 4 | 4 |
| | 9590 | 9595 | 9600 | 9605 | 9609 | 9614 | 9619 | 9624 | 9628 | 9633 | 0 | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 |
| 91 92 | 9638 | 9643 | 9647 | 9652 | 9657 | 9661 | 9666 | 9671 | 9675 | 9680 | 0 | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 |
| 93 | 9685 | 9689 | 9694 | 9699 | 9708 9750 | 9708 9754 | 9713 | 9717 9763 | 9722 9768 | 9727 9773 | 0 | 1 | 1 | 2 2 | 2 | 3 | 3 | 4 | 4 |
| 94 95 | 9731 | 9736 9782 | | 9745 9791 | 9795 | 9800 | 9759 9805 | 9809 | 9814 | 9818 | 0 | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 |
| 96 | 9823 | 9827 | 9832 | 9836 | 9841 | 9845 | 9850 | 9854 | 9859 | 9863 | 0 | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 |
| 97 98 | 9868 | 9872 9917 | 9877 | 9881 | 9886 9930 | 9890 | 9894 | 9899 | 9903 | 9908 | 0 | 1 | 1 | 2 2 | 2 | 3 | 3 | 4 | 4 |
| 99 | 9956 | 9961 | 9965 | 9969 | 9974 | 9978 | 9983 | 9987 | 9991 | 9996 | ŏ | î | î | 2 | 2 | 3 | 3 | 3 | 4 |
| 100 | 0000 | 0004 | 0009 | 0013 | 0017 | 0022 | 0026 | 0030 | 0035 | 0039 | | | | | | | | | |
| 101 102 | 0043 | 0048 | | | | 0065 | 0069 | 0073 | 0077 | 0082 | | | | | | | | | |
| 102 | 0128 | 0133 | 0137 | 0141 | 0145 | 0149 | 0154 | 0158 | 0162 | 0166 | | | | | | | | | |
| 104 105 | | 0178 0216 | | | | 0191 0233 | 0195 0237 | 0199 0241 | 0204 0245 | | | | | | | | | | |
| 106 | 0253 | 0257 | 0261 | 0265 | 0269 | 0273 | 0278 | 0282 | | | | | | | | | | | |
| 107 | 0294 | 0298 | 0302 | 0306 | | 0314 | 0318 | 0322 | | | | | | | | | | | |
| 108 | | | | | | 0354 | | 0362 0402 | | | y | | | | | | | | |
| 110 | | | | | | 0434 | | 0441 | | 0449 | | | | | | | | | |

| | | | | | | | | | | | | | N | Iea | n I | Diffe | ere | nce | es. | |
|---|--|--|--|--|--|--|--|--|--|--|--|-----------------------|----------------------------|----------------------------|---------------|-----------------------|----------------------------|---------------|------------------|------------------|
| | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| | ·00 ·01 ·02 ·03 ·04 ·05 | 1000 1023 1047 1072 1096 1122 | 1002 1026 1050 1074 1099 1125 | 1005 1028 1052 1076 1102 1127 | 1007 1030 1054 1079 1104 1130 | 1009 1033 1057 1081 1107 1132 | 1012 1035 1059 1084 1109 1135 | 1014 1038 1062 1086 1112 1138 | 1016 1040 1064 1089 1114 1140 | 1019 1042 1067 1091 1117 1143 | 1021 1045 1069 1094 1119 1146 | 0 0 0 0 0 0 | 0 0 0 0 1 1 | 1 1 1 1 1 1 | 1 1 1 1 1 1 1 | 1 1 1 1 1 1 1 | 1 1 1 1 2 2 | 2 2 2 2 2 2 2 | 2 2 2 2 2 2 | 2 2 2 2 2 2 |
| | ·06 ·07 ·08 ·09 ·10 | 1148 1175 1202 1230 1259 | 1151 1178 1205 1233 1262 | 1153 1180 1208 1236 1265 | 1156 1183 1211 1239 1268 | 1159 1186 1213 1242 1271 | 1161 1189 1216 1245 1274 | 1164 1191 1219 1247 1276 | 1167 1194 1222 1250 1279 | 1169 1197 1225 1253 1282 | 1172 1199 1227 1256 1285 | 0 0 0 0 | 1 1 1 1 | 1 1 1 1 1 | 1 1 1 1 1 1 | 1 1 1 1 | 2 2 2 2 2 | 2 2 2 2 2 | 2 2 2 2 | 2 3 3 3 |
| | ·11 ·12 ·13 ·14 ·15 | 1288 1318 1349 1380 1413 | 1291 1321 1352 1384 1416 | 1294 1324 1355 1387 1419 | 1297 1327 1358 1390 1422 | 1300 1330 1361 1393 1426 | 1303 1334 1365 1396 1429 | 1306 1337 1368 1400 1432 | 1309 1340 1371 1403 1435 | 1312 1343 1374 1406 1439 | 1315 1346 1377 1409 1442 | 0 0 0 0 | 1 1 1 1 | 1 1 1 1 1 | 1 1 1 1 1 | 2 2 2 2 2 | 2 2 2 2 2 | 2 2 2 2 | 2 2 3 3 3 | 3 3 3 3 3 |
| | ·16 ·17 ·18 ·19 ·20 | 1445 1479 1514 1549 1585 | 1449 1483 1517 1552 1589 | 1452 1486 1521 1556 1592 | 1455 1489 1524 1560 1596 | 1459 1493 1528 1563 1600 | 1462 1496 1531 1567 1603 | 1466 1500 1535 1570 1607 | 1469 1503 1538 1574 1611 | 1472 1507 1542 1578 1614 | 1476 1510 1545 1581 1618 | 0 0 0 0 | 1 1 1 1 | 1 1 1 1 1 | 1 1 1 1 1 | 2 2 2 2 2 | 2 2 2 2 2 | 22233 | 3 3 3 3 | 3 3 3 3 |
| | ·21 ·22 ·23 ·24 ·25 | 1622 1660 1698 1738 1778 | 1626 1663 1702 1742 1782 | 1629 1667 1706 1746 1786 | 1633 1671 1710 1750 1791 | 1637 1675 1714 1754 1795 | 1641 1679 1718 1758 1799 | 1644 1683 1722 1762 1803 | 1648 1687 1726 1766 1807 | 1652 1690 1730 1770 1811 | 1656 1694 1734 1774 1816 | 0 0 0 0 0 | 1 1 1 1 1 | 1 1 1 1 1 | 2 2 2 2 2 | 2 2 2 2 2 | 2 2 2 2 2 | 3 3 3 3 3 | 3 3 3 3 3 | 3 4 4 4 |
| | ·26 ·27 ·28 ·29 ·30 | 1820 1862 1905 1950 1995 | 1824 1866 1910 1954 2000 | 1828 1871 1914 1959 2004 | 1832 1875 1919 1963 2009 | 1837 1879 1923 1968 2014 | 1841 1884 1928 1972 2018 | 1845 1888 1932 1977 2023 | 1849 1892 1936 1982 2028 | 1854 1897 1941 1986 2032 | 1858 1901 1945 1991 2037 | 0 0 0 0 | 1 1 1 1 1 | 1 1 1 1 1 | 2 2 2 2 2 | 2 2 2 2 2 | 3 3 3 3 3 | 3 3 3 3 | 3 4 4 4 | 4 4 4 4 |
| | ·31 ·32 ·33 ·34 ·35 | 2042 2089 2138 2188 2239 | 2046 2094 2143 2193 2244 | 2051 2099 2148 2198 2249 | 2056 2104 2153 2203 2254 | 2061 2109 2158 2208 2259 | 2065 2113 2163 2213 2265 | 2070 2118 2168 2218 2270 | 2075 2123 2173 2223 2275 | 2080 2128 2178 2228 2280 | 2084 2133 2183 2234 2286 | 0 0 0 1 1 | 1 1 1 1 1 | 1 1 1 2 2 | 2 2 2 2 | 2 2 2 3 3 | 3 3 3 3 3 3 | 3 3 4 4 | 4 4 4 4 | 4 4 5 5 |
| | 36 37 38 39 40 | 2291 2344 2399 2455 2512 | 2296 2350 2404 2460 2518 | 2301 2355 2410 2466 2523 | 2307 2360 2415 2472 2529 | 2312 2366 2421 2477 -2535 | 2317 2371 2427 2483 2541 | 2323 2377 2432 2489 2547 | 2328 2382 2438 2495 2553 | 2333 2388 2443 2500 2559 | 2339 2393 2449 2506 2564 | 1 1 1 1 | 1 1 1 1 1 | 2 2 2 2 2 | 2 2 2 2 | 3 3 3 3 | 3 3 3 3 3 4 | 4 4 4 4 | 4 4 5 5 | 5 5 5 5 |
| 1 | ·41 ·42 ·43 ·44 ·45 | 2570 2630 2692 2754 2818 | 2576 2636 2698 2761 2825 | 2582 2642 2704 2767 2831 | 2588 2649 2710 2773 2838 | 2594 2655 2716 2780 2844 | 2600 2661 2723 2786 2851 | 2606 2667 2729 2793 2858 | 2612 2673 2735 2799 2864 | 2618 2679 2742 2805 2871 | 2624 2685 2748 2812 2877 | 1 1 1 1 1 | 1 1 1 1 | 2 2 2 2 2 | 2 2 3 3 3 | 3 3 3 3 | 4 4 4 4 | 4 4 4 5 | 5 5 5 5 5 | 5 6 6 6 |
| - | ·46 ·47 ·48 ·49 ·50 | 2884 2951 3020 3090 3162 | 2891 2958 3027 3097 3170 | 2897 2965 3034 3105 3177 | 2904 2972 3041 3112 3184 | 2911 2979 3048 3119 3192 | 2917 2985 3055 3126 3199 | 2924 2992 3062 3133 3206 | 2931 2999 3069 3141 3214 | 2938 3006 3076 3148 3221 | 2944 3013 3083 3155 3228 | 1 1 1 1 1 | 1 1 1 1 | 2 2 2 2 2 | 3 3 3 3 3 | 3 4 4 4 | 4 4 4 4 | 5 5 5 5 5 | 5 6 6 6 | 6 6 6 7 |

| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 1 | M | Iea | n J | Diff | ere | nce | s. | |
|--|--|--|--|--|--|--|--|--|--|--|-----------------------|---------------------------------|------------------|------------------|------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| | 0 | • | | 3 | * | | | • | • | 9 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| ·50 ·51 ·52 ·53 ·54 ·55 | 3162 3236 3311 3388 3467 3548 | 3170 3243 3319 3396 3475 3556 | 3177 3251 3327 3404 3483 3565 | 3184 3258 3334 3412 3491 3573 | 3192 3266 3342 3420 3499 3581 | 3199 3273 3350 3428 3508 3589 | 3206 3281 3357 3436 3516 3597 | 3214 3289 3365 3443 3524 3606 | 3221 3296 3373 3451 3532 3614 | 3228 3304 3381 3459 3540 3622 | 1 1 1 1 1 | 1 2 2 2 2 2 2 | 2 2 2 2 2 2 2 | 3 3 3 3 3 3 3 | 4 4 4 4 4 | 4 5 5 5 5 5 | 5 5 5 6 6 6 | 6 6 6 6 6 7 | 7 7 7 7 7 7 |
| ·56 ·57 ·58 ·59 ·60 | 3631 3715 3802 3890 3981 | 3639 3724 3811 3899 3990 | 3648 3733 3819 3908 3999 | 3656 3741 3828 3917 4009 | 3664 3750 3837 3926 4018 | 3673 3758 3846 3936 4027 | 3681 3767 3855 3945 4036 | 3690 3776 3864 3954 4046 | 3698 3784 3873 3963 4055 | 3707 3793 3882 3972 4064 | 1 1 1 1 1 | 2 2 2 2 2 2 | 3 3 3 3 3 | 3 3 4 4 4 | 4 4 5 5 | 5 5 5 5 6 | 6 6 6 6 | 77777 | 8 8 8 8 8 |
| ·61 ·62 ·63 ·64 ·65 | 4074 4169 4266 4365 4467 | 4083 4178 4276 4375 4477 | 4093 4188 4285 4385 4487 | 4102 4198 4295 4395 4498 | 4111 4207 4305 4406 4508 | 4121 4217 4315 4416 4519 | 4130 4227 4325 4426 4529 | 4140 4236 4335 4436 4539 | 4150 4246 4345 4446 4550 | 4159 4256 4355 4457 4560 | 1 1 1 1 | 2 2 2 2 | 3 3 3 3 3 | 4 4 4 4 4 | 5 5 5 5 | 6 6 6 | 7777 | 88888 | 9 9 9 |
| ·66 ·67 ·68 ·69 ·70 | 4571 4677 4786 4898 5012 | 4581 4688 4797 4909 5023 | 4592 4699 4808 4920 5035 | 4603 4710 4819 4932 5047 | 4613 4721 4831 4943 5058 | 4624 4732 4842 4955 5070 | 4634 4742 4853 4966 5082 | 4645 4753 4864 4977 5003 | 4656 4764 4875 4989 5105 | 4637 4775 4887 5000 5117 | 1 1 1 1 | 2 2 2 2 | 33334 | 4 4 5 5 | 5 5 6 6 | 6 7 7 7 | 7 8 8 8 8 | 9 | 10 10 10 10 10 |
| ·71 ·72 ·73 ·74 ·75 | 5129 5248 5370 5495 5623 | 5140 5260 5383 5508 5636 | 5152 5272 5395 5521 5649 | 5164 5284 5408 5534 5662 | 5176 5297 5420 5546 5675 | 5188 5309 5433 5559 5639 | 5200 5321 5445 5572 5702 | 5212 5333 5458 5585 5715 | 5224 5346 5470 5598 5728 | 5236 5358 5483 5610 5741 | 1 1 1 1 | 2 3 3 3 | 4 4 4 4 | 5 5 5 5 5 | 6 6 6 7 | 7 8 8 8 | 9 9 | 10 10 10 10 10 | 11 11 |
| ·76 ·77 ·78 ·79 ·80 | 5754 5888 6026 6166 6310 | 5768 5902 6039 6180 6324 | 5781 5916 6053 6194 6339 | 5794 5929 6067 6209 6353 | 5808 5943 6031 6223 6368 | 5821 5957 6095 6237 6383 | 5834 5970 6109 6252 6397 | 5848 5984 6124 6266 6412 | 5861 5998 6138 6281 6427 | 5875 6012 6152 6295 6442 | 1 1 1 1 | 3 3 3 3 | 4 4 4 4 | 5 6 6 6 | 77777 | 8 8 8 9 9 | 10 10 | 11 11 | 12 13 |
| ·81 ·82 ·83 ·84 ·85 | 6457 6607 6761 6918 7079 | 6471 6622 6776 6934 7096 | 6486 6637 6792 6950 7112 | 6501 6653 6808 6966 7129 | 6516 6668 6823 6982 7145 | 6531 6683 6839 6998 7161 | 6546 6699 6855 7015 7178 | 6561 6714 6871 7031 7194 | 6577 6730 6887 7047 7211 | 6592 6745 6902 7063 7228 | 2 2 2 2 2 | 3000000 | 5 5 5 5 5 | 6 6 6 7 | | 9 9 10 10 | 11 | 12 13 13 | 14 14 14 15 15 |
| ·86 ·87 ·88 ·89 ·90 | 7244 7413 7586 7762 7943 | 7261 7430 7603 7780 7962 | 7278 7447 7621 7798 7980 | 7295 7464 7638 7816 7998 | 7311 7482 7656 7834 8017 | 7328 7499 7674 7852 8035 | 7345 7516 7691 7870 8054 | 7362 7534 7709 7889 8072 | 7379 7551 7727 7907 8091 | 7396 7568 7745 7925 8110 | 2 2 2 2 2 | 3 4 4 4 | 5 5 5 6 | 7777 | 9 9 | 10 10 11 11 11 | 12 12 13 | | 16 16 16 |
| ·91 ·92 ·93 ·94 ·95 | 8128 8318 8511 8710 8913 | 8147 8337 8531 8730 8933 | 8166 8356 8551 8750 8954 | 8185 8375 8570 8770 8974 | 8204 8395 8590 8790 8995 | 8222 8414 8610 8810 9016 | 8241 8433 8630 8831 9036 | 8260 8453 8650 8851 9057 | 8279 8472 8670 8872 9078 | 8299 8492 8690 8892 9099 | 2 2 2 2 2 | 4 4 4 4 | 6 6 6 6 | 8 | 10 10 10 | 11 12 12 12 12 | 13 14 14 14 15 | 16 16 | 17 17 18 18 19 |
| ·96 ·97 ·98 ·99 | 9120 9833 9550 9772 | 9141 9354 9572 9795 | 9162 9376 9594 9817 | 9183 9397 9616 9840 | 9204 9419 9638 9863 | 9226 9441 9661 9886 | 9247 9462 9683 9908 | 9268 9484 9705 9931 | 9290 9506 9727 9954 | 9311 9528 9750 9977 | 2 2 2 2 | 4 4 5 | 6 7 7 | 9 | 11 : | 13 13 13 14 | 15 15 16 16 | 17 18 | 19 20 20 20 |

NAPIERIAN LOGARITHMS

of Numbers from 0.1 to 5.09; with Subsidiary Table.

| | | | | unibe | | | | , | | uosiui | | | | | | | | | |
|---------------------------------|---|--------------------------------------|--------------------------------------|--------------------------------------|---|---|--------------------------------------|--------------------------------------|---|--------------------------------------|------------------------------------|------------------------------|----------------------------|----------------------------------|----------------------------|----------------------------------|----------------------------|--|----------------------------|
| Number. | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | | 5 | Sub | sidi | ary | Ta | ble | . [| |
| Nun | | 1 | 4 | | 2 | | 0 | ' | ٥ | | No. | N | ap. | Log | - 1 | No. | Na | p. L | og. |
| 0·1 0·2 0·3 0·4 0·5 | 3.6974 2.3906 .7960 1.0837 3068 | 7927 4393 8288 1084 3267 | 8797 4859 8606 1325 3461 | 9598 5303 8913 1560 3651 | 0339 5729 9212 1790 3838 | 1029 6137 9502 2015 4022 | 1674 6529 9783 2235 4202 | 2280 6907 0057 2450 4379 | 2852 7270 0324 2660 4553 | 3393 7621 0584 2866 4724 | 6 7 8 9 10 20 30 | | | 459 794 972 | 1 | 40 50 60 70 80 90 | 3 4 4 4 4 4 | 688 912 094 248 382 499 | 20 13 35 20 98 |
| 0.6 | 4892 | 5057 | 5220 | 5380 | 5537 | 5692 | 5845 | 5995 | 6143 | 6289 | | Ŋ | Iea | n I | Diffe | eren | ices | | |
| 0·7 0·8 0·9 1·0 | 6433 7769 8946 0 ·0 000 | 6575 7893 9057 0100 | 6715 8015 9166 0198 | 6853 8137 9274 0296 | 6989 8256 9381 0392 | 7123 8375 9487 ₄ 0488 | 7256 8492 9592 0583 | 7386 8607 9695 0677 | 7515 8722 9798 0770 | 7643 8835 9899 0862 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 1·1 1·2 1·3 1·4 1·5 | 0953 1823 2624 3365 4055 | 1044 1906 2700 3436 4121 | 1133 1989 2776 3507 4187 | 1222 2070 2852 3577 4253 | 1310 2151 2927 3646 4318 | 1398 2231 3001 3716 4383 | 1484 2311 3075 3784 4447 | 1570 2390 3148 3853 4511 | 1655 2469 3221 3920 4574 | 1740 2546 3293 3988 4637 | 8 7 7 | | 24 22 21 | 32 30 28 | 40 37 35 | 52 48 45 41 39 | 56 52 48 | 70 64 59 55 52 | 78 72 67 62 58 |
| 1.6 1.7 1.8 1.9 2.0 | 4700 5306 5878 6419 6931 | 4762 5365 5933 6471 6981 | 4824 5423 5988 6523 7031 | 4886 5481 6043 6575 7080 | 4947 5539 6098 6627 7129 | 5008 5596 6152 6678 7178 | 5068 5653 6206 6729 7227 | 5128 5710 6259 6780 7275 | 5188 5766 6313 6831 7324 | 5247 5822 6366 6881 7372 | 5 5 | 12 : 11 : 11 : 10 : | 17 16 15 | | 30 29 27 26 24 | 36 34 32 31 29 | 40 38 | 48 46 43 41 39 | 55 52 49 46 44 |
| 2·1 2·2 2·3 2·4 2·5 | 7419 7885 8329 8755 9163 | 7467 7930 8372 8796 9203 | 7514 7975 8416 8838 9243 | 7561 8020 8459 8879 9282 | 7608 8065 8502 8920 9322 | 7655 8109 8544 8961 9361 | 7701 8154 8587 9002 9400 | 7747 8198 8629 9042 9439 | 7793 8242 8671 9083 9478 | 7839 8286 8713 9123 9517 | 5 4 4 4 4 | 9 : | 14 13 13 12 12 | 19 18 17 16 16 | 23 22 21 20 20 | 28 27 26 24 24 | 33 31 30 29 27 | 37 36 34 33 31 | 42 40 38 37 35 |
| 2·6 2·7 2·8 2·9 3·0 | 9555 9933 1.0296 0647 0986 | 9594 9969 0332 0682 1019 | 9632 0006 0367 0716 1053 | 9670 0043 0403 0750 1086 | 9708 $\overline{0}080$ 0438 0784 1119 | 9746 0116 0473 0818 1151 | 9783 0152 0508 0852 1184 | 9821 0188 0543 0886 1217 | 9858 $\overline{0}225$ 0578 0919 1249 | 9895 0260 0613 0953 1282 | 4 4 3 3 | 7 | 11 11 11 10 10 | 15 15 14 14 14 13 | 18 18 17 | 23 22 21 20 20 | 26 25 24 | 30 29 28 27 26 | 34 33 32 31 30 |
| 3·1 3·2 3·3 3·4 3·5 | 1314 1632 1939 2238 2528 | 1346 1663 1969 2267 2556 | 1378 1694 2000 2296 2585 | 1410 1725 2030 2326 2613 | 1442 1756 2060 2355 2641 | 1474 1787 2090 2384 2669 | 1506 1817 2119 2413 2698 | 1537 1848 2149 2442 2726 | 1569 1878 2179 2470 2754 | 1600 1909 2208 2499 2782 | 03 03 03 03 | 6 6 6 6 | 10 9 9 9 8 | 12 12 12 | 15 15 14 | 19 18 18 17 17 | 22 21 21 20 20 | 25 25 24 23 22 | 29 28 27 26 25 |
| 3.6 3.7 3.8 3.9 4.0 | 2809 3083 3350 3610 3863 | 2837 3110 3376 3635 3888 | 2865 3137 3403 3661 3913 | 2892 3164 3429 3686 3938 | 2920 3191 3455 3712 3962 | 2947 3218 3481 3737 3987 | 2975 3244 3507 3762 4012 | 3002 3271 3533 3788 4036 | 3029 3297 3558 3813 4061 | 3056 3324 3584 3838 4085 | 3 3 3 2 | 5 5 5 5 | 8 8 8 8 7 | 11 10 10 | 14 13 13 13 12 | 16 16 15 | 19 18 18 | 22 21 21 20 20 | 25 24 23 23 22 |
| 4·1 4·2 4·3 4·4 4·5 | 4110 4351 4586 4816 5041 | 4134 4375 4609 4839 5063 | 4159 4398 4633 4861 5085 | 4183 4422 4656 4884 5107 | 4207 4446 4679 4907 5129 | 4231 4469 4702 4929 5151 | 4255 4493 4725 4951 5173 | 4279 4516 4748 4974 5195 | 4303 4540 4770 4996 5217 | 4327 4563 4793 5019 5239 | 2 2 2 2 2 | 5 5 4 4 | 7 7 7 7 7 7 | 9 | 12 | 14 14 14 13 13 | | 19 19 18 18 18 | 22 21 21 20 20 |
| 4.6 4.7 4.8 4.9 5.0 | 5261 5476 5686 5892 6094 | 5282 5497 5707 5913 6114 | 5304 5518 5728 5933 6134 | 5326 5539 5748 5953 6154 | 5347 5560 5769 5974 6174 | 5369 5581 5790 5994 6194 | 5390 5602 5810 6014 6214 | 5412 5623 5831 6034 6233 | 5433 5644 5851 6054 6253 | 5454 5665 5872 6074 6273 | 2 2 2 2 2 | 4 4 4 4 | 6 6 6 6 | 8 8 8 | 11 11 10 10 | 13 13 12 12 12 | 15 14 14 | 17 17 16 16 16 | 19 19 18 |
| | 1 | | 1 | 1 | , | | 1 | 1 | 1 | | | | | 1 | | 1 | | -6 | |

| | | | | | | | | | | | ean Diff. | to | of A | Log | s. of espon | Sines |
|------------|----------------|--------------|--------------|--------------|-----------------------|---------------------|---------------------|---------------------|---------------------|--------------|-----------|----------|-----------|----------|----------------|----------|
| Arc | 0′ | 1′ | 2′ | 3′ | 4′ | 5′ | 6′ | 7′ | 8′ | 9′ | Meg | 0′ | 2′ | 4′ | 6′ | 8′ |
| 0° 0′ | <u>-</u> - | 4637 | 7648 | 9408 | 0658 | 1 627 | $\overline{2}419$ | 3088 | 366S | 4180 | | 0 | 0 | 0 | 0 | 0 |
| 10' | 3.4637 | 5051 | 5429 | 5777 | 6099 | 6398 | 6678 | 6942 | 7190 | 7425 | | 0 | 0 | 0 | 0 | 0 |
| 20′ 30′ | 9408 | 7859 9551 | 9689 | 8255 9822 | 8439 9952 | 8617 0078 | 8787 0200 | $\frac{8951}{0319}$ | 9109 0435 | 9261 0548 | | 0 | 1 0 | 0 | 0 | 0 |
| 40' | 2.0658 | 0765 | 0870 | 0972 | 1072 | 1169 | 1265 | 1358 | 1450 | 1539 | | 0 | 0 | 0 | 0 | 0 |
| 50′ | 1627 | 1713 | 1797 | 1880 | 1961 | 2041 | 2119 | 2196 | 2271 | 2346 | | 0 | 1 | 1 | 1 | 1 |
| 1° 0′ | 2419 3088 | 2490 3150 | 2561 3210 | 2630 3270 | 2699 3329 | 2766 | 2832 3445 | 2898 3502 | 2962 3558 | 3025 3613 | 67 58 | 0 | 1 | 1 | 1 | 1 |
| 10' 20' | 3668 | 3722 | 3775 | 3828 | 3880 | 3388 3931 | 3982 | 4032 | 4082 | 4131 | 51 | 1 | 1 | 1 | 1 | 1 |
| 30′ 40′ | 4179 4637 | 4227 | 4275 4723 | 4322 4765 | 4368 | 4414 | 4459 4890 | 4504 | 4549 | 4593 5011 | 46 | 2 | 1 2 | 2 | 2 | 2 |
| 50' | 5050 | 5090 | 5129 | 5167 | 5206 | 5243 | 5281 | 5318 | 5355 | 5392 | 38 | 3 | 2 | 2 | 2 | 3 |
| 2° 0′ | 5428 5776 | 5464 5809 | 5500 5842 | 5535 5875 | 5571 5907 | 5605 5939 | 5640 5972 | 5674 6003 | 5708 6035 | 5742 6066 | 35 32 | 3 3 | 3 | 2 4 | 3 | 3 |
| 10' 20' | 6097 | 6128 | 6159 | 6189 | 6220 | 6250 | 6279 | 6309 | 6339 | 6368 | 30 | 4 | 4 | 3 | 4 | 4 |
| 30' 40' | 6397 6677 | 6426 6704 | 6454 6731 | 6483 6758 | 6511 6784 | 6539 6810 | 6567 6837 | 6595 6863 | 6622 6889 | 6650 6914 | 28 26 | 5 | 5 | 5 | 4 5 | 5 |
| 50′ | 6940 | 6965 | 6991 | 7016 | 7041 | 7066 | 7090 | 7115 | 7140 | 7164 | 25 | 5 | 5 | 5 | 6 | 5 |
| 3° 0' | 7188 | 7212 | 7236 | 7260 | 7283 | 7307 | 7330 | 7354 | 7377 7602 | 7400 | 23 22 | 6 | 6 | 7 | 7 8 | 6 |
| 10' 20' | 7423 7645 | 7445 7667 | 7468 7688 | 7491 7710 | 7513 7731 | 7535 7752 | 7557 7773 | 7580 7794 | 7815 | 7623 7836 | 21 | 7 | 8 | 8 | 8 | 8 |
| 30′ 40′ | 7857 8059 | 7877 8078 | 7898 8098 | 7918 8117 | 7939 8137 | 7959 8156 | 7979 8175 | 7999 8194 | 8019 8213 | 8039 8232 | 20 19 | 8 8 | 8 | 8 | 9 | 9 |
| 50′ | 8251 | 8270 | 8289 | 8307 | 8326 | 8345 | 8363 | 8381 | 8400 | 8418 | 18 | 10 | 10 | 10 | 10 | 10 |
| 4° 0′ | 8436 | 8454 | 8472 | 8490 | 8508 | 8525 | 8543 | 8560 | 8578 8749 | 8595 | 18 17 | 10 | 11 12, | 10 | 11 12 | 11 13 |
| 10' 20' | 8613 8783 | 8630 8799 | 8647 8816 | 8665 8833 | 8682 8849 | 8699 8865 | 8716 8882 | 8733 8898 | 8914 | 8766 8930 | 16 | 11 12 | 13 | 13 | 13 | 13 |
| 30′ 40′ | 8946 9104 | 8962 9119 | 8978 9135 | 8994 9150 | 9010 9166 | 9026 9181 | 9042 9196 | 9057 | 9073 9226 | 9089 | 16 15 | 14 | 14 15 | 14 14 | 14 15 | 14 15 |
| 50′ | 9256 | 9271 | 9286 | 9301 | 9315 | 9330 | 9345 | 9359 | 9374 | 9388 | 15 | 16 | 16 | 16 | 16 | 16 |
| 5° 0′ | 9403 | 9417 | 9432 | 9446 | 9460 | 9475 | 9489 | 9503 9642 | 9517 9655 | 9531 9669 | 14 | 17 18 | 17 18 | 17 18 | 17 18 | 17 19 |
| 10′ 20′ | 9545 9682 | 9559 9696 | 9573 9709 | 9587 9723 | 9601 97 3 6 | 9614 9750 | 9628 9763 | 9776 | 9789 | 9803 | 13 | 19 | 20 | 20 | 19 | 20 |
| 30′ | 9816 | 9829 | 9842 | 9855 | 9868 | $\frac{9881}{0008}$ | $\frac{9894}{0021}$ | 9907 | $\frac{9919}{0046}$ | 9932 | 13 | 20 21 | 20 22 | 20 21 | 21 22 | 21 22 |
| 40′ 50′ | 9945 1.0070 | 9958 0083 | 9970 | 9983 0107 | 9996 0120 | 0132 | 0144 | 0156 | 0168 | 0180 | 12 | 23 | 23 | 23 | 23 | 24 |
| 6° 0′ | 0192 | 0204 | 0216 | 0228 | 0240 | 0252 | 0264 | 0276 | 0287 | 0299 | 12 | 24 | 24 | 25 | 25 | 25 |
| 10' 20' | 0311 0426 | 0323 0438 | 0334 0449 | 0346 0460 | $0357 \\ 0472$ | 0369 0483 | 0380 | 0392 0505 | 0403 0516 | 0415 | 12 11 | 25 27 | 26 27 | 26 27 | 27 27 | 27 28 |
| 30′ | 0539 | 0550 | 0561 | 0572 | 0583 | 0594 | 0605 | 0616 | 0626 | 0637 | 11 | 28 | 28 | 28 | 28 | 30 |
| 40′ 50′ | 0648 0755 | 0659 0765 | 0670 0776 | 0680 0786 | 0691 0797 | 0702 | 0712 0818 | 0723 0828 | 0734 0838 | 0744 0849 | 11. 10 | 30 31 | 29 31 | 30 31 | 31 31 | 30 33 |
| 7° 0′ | 0859 | 0869 | 0879 | 0890 | 0900 | 0910 | 0920 | 0930 | 0940 | 0951 | 10 | 32 | 33 | 33 | 34 | 34 |
| 10' 20' | 0961 1060 | 0971 1070 | 0981 1080 | 0991 1089 | 1001 1099 | 1011 1109 | 1020 1118 | 1030 1128 | 1040 1138 | 1050 1147 | 10 | 34 36 | 34 36 | 34 | 35 37 | 36 37 |
| 30' | 1157 | 1167 | 1176 | 1186 | 1195 | 1205 | 1214 | 1224 | 1233 | 1242 | 10 | 37 | 38 | 38 | 38 40 | 39 |
| 40′ 50′ | 1252 1345 | 1261 1354 | 1271 1363 | 1280 1372 | 1289 1381 | 1299 1390 | 1308 1399 | 1317 1409 | 1326 1418 | 1336 1427 | 9 | 39 40 | 39 41 | 40 42 | 42 | 41 42 |

| ın. | ee. | 0′ | 6′ | 12' | 18' | 24' | 30′ | 36′ | 42' | 40/ | F4/ | Mea | ın I | oiffe | ren | ces. |
|--|----------------------------|--|--|--|--|--|--|--|--|--|--|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| Radian. | Degree. | 0°.0 | 0°·1 | 0°.2 | 03 | 0°·4 | 0°·5 | 0°·6 | 0°.7 | 48′ 0°•8 | 54′ 0°·9 | 1' | 2′ | 3′ | 4' | 5′_ |
| *0000 *0175 *0349 *0524 *0698 *0873 | 0 1 2 3 4 5 | -∞ 2·2419 ···5428 ···7188 ···8436 ···9403 | 3·2419 2832 5640 7330 8543 9489 | 5429 3210 5842 7468 8647 9573 | 7190 3558 6035 7602 8749 9655 | 8439 3880 6220 7731 8849 9736 | 9408 4179 6397 7857 8946 9816 | 0200 4459 6567 7979 9042 9894 | 0870 4723 6731 8098 9135 9970 | 1450 4971 6889 8213 9226 0046 | 1961 5206 7041 8326 9315 0120 | 16 13 | 32 26 | 48 39 | 64 52 | 80 65 |
| *1047 *1222 *1396 *1571 *1745 | 6 7 8 9 10 | ī·0192 "·0859 "·1436 "·1943 "·2397 | 0264 0920 1489 1991 2439 | 0334 0981 1542 2038 2482 | 0403 1040 1594 2085 2524 | 0472 1099 1646 2131 2565 | 0539 1157 1697 2176 2606 | 0605 1214 1747 2221 2647 | 0670 1271 1797 2266 2687 | 0734 1326 1847 2310 2727 | 0797 1381 1895 2353 2767 | 11 10 8 8 7 | 22 19 17 15 14 | 33 29 25 23 20 | 44 38 34 30 27 | 55 48 42 38 34 |
| *1920 *2094 *2269 *2443 *2618 | 11 12 13 14 15 | 1:2806 ::3179 ::3521 ::3837 ::4130 | 2845 3214 3554 3867 4158 | 2883 3250 3586 3897 4186 | 2921 3284 3618 3927 4214 | 2959 3319 3650 3957 4242 | 2997 3353 3682 3986 4269 | 3034 3387 3713 4015 4296 | 3070 3421 3745 4044 4323 | 3107 3455 3775 4073 4350 | 3143 3488 3806 4102 4377 | 6 5 5 5 | 12 11 11 10 9 | 19 17 16 15 14 | 25 23 21 20 18 | 31 28 26 24 23 |
| •2793 •2967 •3142 •3316 •3491 | 16 17 18 19 20 | ".4403 ".4659 ".4900 ".5126 ".5341 | 4430 4684 4923 5148 5361 | 4456 4709 4946 5170 5382 | 4482 4733 4969 5192 5402 | 4508 4757 4992 5213 5423 | 4533 4781 5015 5235 5443 | 4559 4805 5037 5256 5463 | 4584 4829 5060 5278 5484 | 4609 4853 5082 5299 5504 | 4634 4876 5104 5320 5523 | 4 4 4 3 | 98877 | 13 12 11 11 10 | 17 16 15 14 14 | 21 20 19 18 17 |
| *3665 *3840 *4014 *4189 *4363 | 21 22 23 24 25 | "5543 "5736 "5919 "6093 "6259 | 5563 5754 5937 6110 6276 | 5583 5773 5954 6127 6292 | 5602 5792 5972 6144 6308 | 5621 5810 5990 6161 6324 | 5641 5828 6007 6177 6340 | 5660 5847 6024 6194 6356 | 5679 5865 6042 6210 6371 | 5698 5883 6059 6227 6387 | 5717 5901 6076 6243 6403 | 3 3 3 3 | 6 6 6 5 | 10 9 9 8 8 | 13 12 12 11 11 | 16 15 15 14 13 |
| *4538 *4712 *4887 *5061 *5236 | 26 27 28 29 30 | "6418 "6570 "6716 "6856 "6990 | 6434 6585 6730 6869 7003 | 6449 6600 6744 6883 7016 | 6465 6615 6759 6896 7029 | 6480 6629 6773 6910 7042 | 6495 6644 6787 6923 7055 | 6510 6659 6801 6937 7068 | 6526 6673 6814 6950 7080 | 6541 6687 6828 6963 7093 | 6556 6702 6842 6977 7106 | 3 2 2 2 2 2 | 5 5 4 4 | 8 7 7 6 | 10 10 9 9 | 13 12 12 11 11 |
| *5411 *5585 *5760 *5934 *6109 | 31 32 33 34 35 | "*7118 "*7242 "*7361 "*7476 "*7586 | 7131 7254 7373 7487 7597 | 7144 7266 7384 7495 7607 | 7156 7278 7396 7509 7618 | 7168 7290 7407 7520 7629 | 7181 7302 7419 7531 7640 | 7193 7314 7430 7542 7650 | 7205 7326 7442 7553 7661 | 7218 7338 7453 7564 7671 | 7230 7349 7464 7575 7682 | 2 2 2 2 2 2 | 4 4 4 4 | 6 6 6 5 | 8 8 8 7 7 | 10 10 10 9 9 |
| *6283 *6458 *6632 *6807 *6981 | 36 37 38 39 40 | "*7692 "*7795 "*7893 "*7989 "*8081 | 7703 7805 7903 7998 8090 | 7713 7815 7913 8007 8099 | 7723 7825 7922 8017 8108 | 7734 7835 7932 8026 8117 | 7744 7844 7941 8035 8125 | 7754 7854 7951 8044 8134 | 7764 7864 7960 8053 8143 | 7774 7874 7970 8063 8152 | 7785 7884 7979 8072 8161 | 2 2 2 2 1 | 3 3 3 3 | 5 5 5 4 | 7 7 6 6 6 | 9 8 8 8 7 |
| *7156 *7330 *7505 *7679 *7854 | 41 42 43 44 45 | "*8169 "*8255 "*8338 "*8418 "*8495 | 8178 8264 8346 8426 8502 | 8187 8272 8354 8433 8510 | 8195 8280 8362 8441 8517 | 8204 8289 8370 8449 8525 | 8213 8297 8378 8457 8532 | 8221 8305 8386 8464 8540 | 8230 8313 8394 8472 8547 | 8238 8322 8402 8480 8555 | 8247 8330 8410 8487 8562 | 1 1 1 1 | 3 3 3 2 | 4 4 4 4 | 6 5 5 5 | 7 7 7 6 6 |
| | F | Radian = | 0017 | 0035 | 0052 | 0070 | 0087 | 0105 | 0122 | 0140 | 0157 | | | - | _ | 110 |

| an. | .ee. | 0′ | 6′ | 12' | 18' | 24' | 30′ | 36′ | 426 | 48' | 54' | Me | an I | Diffe | renc | es. |
|--|----------------------------------|--|--|--|--|--|--|--|--|---|--|----------------------------|----------------------------|-----------------------|----------------------------|-----------------------|
| Radian. | Degree. | 0,.0 | 0°·1 | 05 | 0°·3 | 0°.4 | 0°.5 | 06 | 0°·7 | 0°.8 | 0°.9 | 1' | 2′ | 3′ | 4' | 5′ |
| *785 *803 *820 *838 *855 *873 | 45 46 47 48 49 50 | 1·8495 1·8569 1·8641 1·8711 1·8778 1·8843 | 8502 8577 8648 8718 8784 8849 | 8510 8584 8655 8724 8791 8855 | 8517 8591 8662 8731 8797 8862 | 8525 8598 8669 8738 8804 8868 | 8532 8606 8676 8745 8810 8874 | 8540 8613 8683 8751 8817 8880 | 8547 8620 8690 8758 8823 8887 | 8555 8627 \$697 8765 8830 8893 | 8562 8634 8704 8771 8836 8899 | 1 1 1 1 1 1 | 2 2 2 2 2 2 | 4 4 3 3 3 3 3 | 5 5 5 4 4 4 | 6 6 6 5 5 |
| *890 *908 *925 *942 *960 | 51 52 53 54 55 | 18905 18965 19023 19080 19134 | 8911 8971 9029 9085 9139 | 8917 8977 9035 9091 9144 | 8923 8983 9041 9096 9149 | 8929 8989 9046 9101 9155 | 8935 8995 9052 9107 9160 | 8941 9000 9057 9112 9165 | 8947 9006 9063 9118 9170 | 8953 9012 9069 9123 9175 | 8959 9018 9074 9128 9181 | 1 1 1 1 | 2 2 2 2 2 | 3 3 3 3 | 4 4 4 3 | 5 5 5 4 |
| '977 '995 1'012 1'030 1'047 | 56 57 58 59 60 | "'9186 "'9236 "'9284 "'9331 "'9375 | 9191 9241 9289 9335 9380 | 9196 9246 9294 9340 9384 | 9201 9251 9298 9344 9388 | 9206 9255 9303 9349 9393 | 9211 9260 9308 9353 9397 | 9216 9265 9312 9358 9401 | 9221 9270 9317 9362 9406 | 9226 9275 9322 9367 9410 | 9231 9279 9326 9371 9414 | 1 1 1 1 | 2 2 2 1 1 | 3 2 2 2 2 | 3 3 3 3 | 4 4 4 4 |
| 1:065 1:082 1:100 1:117 1:134 | 61 62 63 64 65 | ".9418 ".9459 ".9499 ".9537 | 9422 9463 9503 9540 9576 | 9427 9467 9507 9544 9580 | 9431 9471 9510 9548 9583 | 9435 9475 9514 9551 9587 | 9439 9479 9518 9555 9590 | 9443 9483 9522 9558 9594 | 9447 9487 9525 9562 9597 | 9451 9491 9529 9566 9601 | 9455 9495 9533 9569 9604 | 1 1 1 1 | 1 1 1 1 1 | 2 2 2 2 2 | 3 3 2 2 | 3 3 3 3 |
| 1·152 1·169 1·187 1·204 1·222 | 66 67 68 69 70 | 11*9607 11*9640 11*9672 11*9702 11*9730 | 9611 9643 9675 9704 9733 | 9614 9647 9678 9707 9735 | 9617 9650 9681 9710 9738 | 9621 9653 9684 9713 9741 | 9624 9656 9687 9716 9743 | 9627 9659 9690 9719 9746 | 9631 9662 9693 9722 9749 | 9634 9666 9696 9724 9751 | 9637 9669 9699 9727 9754 | 1 1 0 0 0 | 1 1 1 1 | 2 2 1 1 1 | 2 2 2 2 2 2 | 3 2 2 2 |
| 1·239 1·257 1·274 1·292 1·309 | 71 72 73 74 75 | "*9757 "*9782 "*9806 "*9828 "*9849 | 9759 9785 9808 9831 9851 | 9762 9787 9811 9833 9853 | 9764 9789 9813 9835 9855 | 9767 9792 9815 9837 9857 | 9770 9794 9817 9839 9859 | 9772 9797 9820 9841 9861 | 9775 9799 9822 9843 9863 | 9777 9801 9824 9845 9865 | 9780 9804 9826 9847 9867 | 0 0 0 0 | 1 1 1 1 | 1 1 1 1 1 | 2 2 2 1 1 | 2 2 2 2 2 |
| 1·326 1·344 1·361 1·379 1·396 | 76 77 78 79 80 | "*9869 "*9887 "*9904 "*9919 | 9871 9889 9906 9921 9935 | 9873 9891 9907 9922 9936 | 9875 9892 9909 9924 9937 | 9876 9894 9910 9925 9939 | 9878 9896 9912 9927 9940 | 9880 9897 9913 9928 9941 | 9882 9899 9915 9929 9943 | 9884 9901 9916 9931 9944 | 9885 9902 9918 9932 9945 | 0 0 0 0 0 | 1 1 0 0 | 1 1 1 1 | 1 1 1 1 | 2 1 1 1 1 |
| 1·414 1·431 1·449 1·466 1·484 | 81 82 83 84 85 | "*9946 "*9958 "*9968 "*9976 "*9983 | 9947 9959 9968 9977 9984 | 9949 9960 9969 9978 9985 | 9950 9961 9970 9978 9985 | 9951 9962 9971 9979 9986 | .9952 9963 9972 9980 9987 | 9953 9964 9973 9981 9987 | 9954 9965 9974 9981 9988 | 9955 9966 9975 9982 9988 | 9956 9967 9975 9983 9989 | 0 0 0 0 | 0 0 0 0 | 1 1 0 0 0 | 1 1 1 0 0 | 1 1 1 1 0 |
| 1.501 1.518 1.536 1.553 1.571 | 86 87 88 89 90 | "*9989 "*9994 "*9997 "*9999 0.0000 | 9990 9994 9998 9999 | 9990 9995 9998 0000 | 9991 9995 9998 0000 | 9991 9996 9998 0000 | 9992 9996 9999 0000 | 9992 9996 9999 0000 | 9993 9996 9999 0000 | 9993 9997 9999 0000 | 9994 9997 9999 0000 | 0 0 0 0 | 0 0 0 | 0 0 0 0 | 0 0 0 0 | 0 0 0 0 |
| 1.571 | | Radian= | :0017 | 0035 | 0052 | 0070 | 0087 | 0105 | 0122 | 0140 | 0157 | | | | | |

| Radian. | Degree. | 0' | 6' | 12' | 18' | 24' | 30′ | 36' | 42' | 48' | 54' | Me | an 1 | Diffe | ren | ces. |
|----------------|----------|--------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|----|------|--------|-----|------|
| Rad | Deg | 0,.0 | 0°·1 | 0°·2 | 03 | 0°·4 | 0°·5 | 0°.6 | 0°·7 | 08 | 0°.9 | 1′ | 2′ | 3′ | 4' | 5′ |
| 0000 | 0 | 0.0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 9999 | 0 | 0 | 0 | 0 | 0 |
| 0175 | 1 | 1.9999 | 9999 | 9999 | 9999 | 9999 | 9999 | 9998 | 9998 | 9998 | 9998 | 0 | 0 | 0 | 0 | 0 |
| $0349 \\ 0524$ | 2 3 | 11.9997 11.9994 | 9994 | 9997 | 9996 | 9996 9992 | 9996 | 9996 | 9995 | 9995 | 9994 | 0 | 0 | 0 | 0 | 0 |
| 0698 | 4 | 11.9989 | 9989 | 9988 | 9988 | 9987 | 9987 | 9986 | 9985 | 9985 | 9984 | 0 | 0 | 0 | 0 | 0 |
| 0873 | 5 | 11*9983 | 9983 | 9982 | 9981 | 9981 | 9980 | 9979 | 9978 | 9978 | 9977 | 0 | 0 | 0 | 0 | 1 |
| 1047 | 6 | 11*9976 | 9975 9967 | 9975 9966 | 9974 9965 | 9973 9964 | 9972 9963 | 9971 9962 | 9970 9961 | 9969 9960 | 9968 9959 | 0 | 0 | 0 1 | 1 | 1 |
| 1396 | 8 | 11.9958 | 9956 | 9955 | 9954 | 9953 | 9952 | 9951 | 9950 | 9949 | 9939 | 0 | 0 | i | î | 1 |
| 1571 | 9 | 11'9946 | 9945 | 9944 | 9943 | 9941 | 9940 | 9939 | 9937 | 9936 | 9935 | 0 | 0 | 1 | 1 | 1 |
| 1745 | 10 | ıı*9934 | 9932 | 9931 | 9929 | 9928 | 9927 | 9925 | 9924 | 9922 | 9921 | 0 | 0 | 1 | 1 | 1 |
| 1920 2094 | 11 12 | 11°9919 11°9904 | 9918 9902 | 9916 9901 | 9915 9899 | 9913 9897 | 9912 9896 | 9910 9894 | 9909 9892 | 9907 9891 | 9906 9889 | 0 | 1 | 1 | 1 | 1 |
| 2269 | 13 | ıı 9887 | 9385 | 9384 | 9882 | 9880 | 9878 | 9876 | 9875 | 9873 | 9871 | 0 | 1 | 1 | 1 | 2 |
| 2443 2618 | 14 | 11.9869 | 9867 9847 | 9365 9845 | 9863 9843 | 9861 9841 | 9859 | 9857 9837 | 9855 9835 | 9853 9833 | 9851 9831 | 0 | 1 | 1 | 1 | 2 2 |
| | 10 | 11.9849 | 9341 | 9540 | 9843 | | 9839 | 9001 | 9000 | 9000 | 9831 | U | 1 | 1 | 1 | Ī |
| 2793 2967 | 16 | 11.9828 | 9826 | 9824 9801 | 9822 | 9820 | 9817 | 9815 | 9813 | 9811 | 9808 | 0 | 1 | 1 | 2 | 2 |
| 3142 | 18 | 11.9806 11.9782 | 9804 9780 | 9777 | 9799 9775 | 9797 9772 | 9794 9770 | 9792 9767 | 9789 9764 | 9787 9762 | 9785 9759 | 0 | 1 | 1 | 2 | 2 |
| 316 | 19 | 9757 | 9754 | 9751 | 9749 | 9746 | 9743 | 9741 | 9738 | 9735 | 9733 | 0 | 1 | 1 | 2 2 | 2 |
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| 3665 3840 | 21 22 | ".9702 ".9672 | 9699 9639 | 9696 9666 | 9693 9662 | 9690 9659 | 9687 9656 | 9684 9653 | 9681 9650 | 9678 9647 | 9675 9643 | 0 | 1 | 1 2 | 2 2 | 2 3 |
| 1014 | 23 | 11 9612 | 9637 | 9634 | 9631 | 9627 | 9624 | 9621 | 9617 | 9614 | 9611 | i | 1 | 2 | 2 | 3 |
| 1189 | 24 | 11.9607 | 9604 | 9601 | 9597 | 9594 | 9590 | 9587 | 9583 | 9580 | 9576 | 1 | 1 | 2 | 2 | 3 |
| 1363 | 25 | ···9573 | 9569 | 9566 | 9562 | 9558 | 9555 | 9551 | 9548 | 9544 | 9540 | 1 | 1 | 2 | 2 | 3 |
| 1538 | 26 | ···9537 | 9533 | 9529 | 9525 | 9522 | 9518 | 9514 | 9510 | 9507 | 9503 | 1 | 1 | 2 | 3 | 3 |
| 1712 1887 | 27 28 | 11.9499 11.9459 | 9495 9455 | 9491 9451 | 9487 9447 | 9483 9443 | 9479 9439 | 9475 | 9471 9431 | 9467 9427 | 9463 9422 | 1 | 1 | 2 | 3 | 3 |
| 5061 | 29 | 11.9418 | 9414 | 9410 | 9406 | 9401 | 9397 | 9393 | 9388 | 9384 | 9380 | i | i | 2 | 3 | 4 |
| 5236 | 30 | ıı •9375 | 9371 | 9367 | 9362 | 9358 | 9353 | 9349 | 9344 | 9340 | 9335 | 1 | 1 | 2 | 3 | 4 |
| 5411 | 31 32 | 11.9331 | 9326 | 9322 | 9317 9270 | 9312 | 9308 | 9303 | 9298 | 9294 | 9289 | 1 | 2 | 2 | 3 | 4 |
| 5585 5760 | 33 | 11*9284 | 9279 9231 | 9275 9226 | 9270 | 9265 9216 | 9260 | 9255 9206 | 9251 9201 | 9246 9196 | 9241 9191 | 1 | 2 | 2 | 3 | 4 |
| 5934 | 34 | 9186 | 9181 | 9175 | 9170 | 9165 | 9160 | 9155 | 9149 | 9144 | 9139 | 1 | 2 | 3 | 3 | 4 |
| 3109 | 35 | ···9134 | 9128 | 9123 | 9118 | 9112 | 9107 | 9101 | 9096 | 9091 | 9085 | 1 | 2 | 3 | 4 | 5 |
| 5283 5458 | 36 37 | 11*9080 11*9023 | 9074 9018 | 9069 9012 | 9063 9006 | 9057 9000 | 9052 8995 | 9046 8989 | 9041 8983 | 9035 8977 | 9029 8971 | 1 | 2 2 | 3 | 4 | 5 |
| 3632 | 38 | 11.8965 | 8959 | 8953 | 8947 | 8941 | 8935 | 8929 | 8923 | 8917 | 8911 | 1 | 2 | 3 | 4 | 5 |
| 807 | 39 | 11.8905 | 8899 | 8893 | 8887 | 8880 | 8874 | 8868 | 8862 | 8855 | 8849 | 1 | 2 | 3 | 4 | 5 |
| 981 | 40 | 11.8843 | 8836 | 8830 | 8823 | 8817 | 8810 | 8804 | 8797 | 8791 | 8784 | 1 | 2 | 3 | 4 | 5 |
| 156 330 | 41 42 | "*8778 "*8711 | 8771 8704 | 8765 8697 | 8758 8690 | 8751 8683 | 8745 8676 | 8738 8669 | 8731 8662 | 8724 8655 | 8718 8648 | 1 | 2 | 3 | 5 | 6 |
| 505 | 43 | 11.8641 | 8634 | 8627 | 8620 | 8613 | 8606 | 8598 | 8591 | 8584 | 8577 | 1 | 2 2 | 4 | 5 | 6 |
| 679 | 44 | ıı*8569 | 8562 | 8555 | 8547 | 8540 | 8532 | 8525 | 8517 | 8510 | 8502 | 1 | 2 | 4 | 5 | 6 |
| 854 | 45 | ıı*8495 | 8487 | 8480 | 8472 | 8464 | 8457 | 8449 | 8441 | 8433 | 8426 | 1 | 3 | 4 | 5 | 6 |

| | _ | | | | | | | | | | | | | | | |
|--|----------------------------|---|---|--|--|--|--|--|--|--|--|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| Radian. | Degree. | 0' | 6′ | 12' | 18' | 24' | 30′ | 36′ | 42' | 48' | 54' | M | ean 1 | Diffe | renc | es. |
| Rac | Deg | 0°·0 | 0°·1 | 0°·2 | 0°.3 | 0°·4 | 0°·5 | 0°·6 | 0°·7 | 08 | 0°•9 | 1′ | 2′ | 3′ | 4′ | 5′ |
| *785 *803 *820 *838 *855 *873 | 46 47 48 49 | 1.8495 8418 8338 8255 8169 8081 | 8487 8410 8330 8247 8161 8072 | 8480 8402 8322 8238 8152 8063 | 8472 8394 8313 8230 8143 8053 | 8464 8386 8305 8221 8134 8044 | 8457 8378 8297 8213 8125 8035 | 8449 8370 8289 8204 8117 8026 | 8441 8362 8280 8195 8108 8017 | 8433 8354 8272 8187 8099 8007 | 8426 8346 8264 8178 8090 7998 | 1 1 1 1 1 2 | 3 3 3 3 3 | 4 4 4 4 5 | 5 6 6 6 6 | 6 7 7 7 7 8 |
| *890 *908 *925 *942 *960 | 52 53 54 | ".7989 ".7893 ".7795 ".7692 ".7586 | 7979 7884 7785 7682 7575 | 7970 7874 7774 7671 7564 | 7960 7864 7764 7661 7553 | 7951 7854 7754 7650 7542 | 7941 7844 7744 7640 7531 | 7932 7835 7734 7629 7520 | 7922 7825 7723 7618 7509 | 7913 7815 7713 7607 7498 | 7903 7805 7703 7597 7487 | 2 2 2 2 2 2 | 3 3 4 4 | 5 5 5 6 | 6 7 7 7 | 8 8 9 9 |
| *977 *995 1.012 1.030 1.047 | 58 | ".7476 ".7361 ".7242 ".7118 | 7464 7349 7230 7106 6977 | 7453 7338 7218 7093 6963 | 7442 7326 7205 7080 6950 | 7430 7314 7193 7068 6937 | 7419 7302 7181 7055 6923 | 7407 7290 7168 7042 6910 | 7396 7278 7156 7029 6896 | 7384 7266 7144 7016 6883 | 7373 7254 7131 7003 6869 | 2 2 2 2 2 2 | 4 4 4 4 | 6 6 6 7 | 8 8 9 9 | 10 10 10 11 11 |
| 1.065 1.082 1.100 1.117 1.134 | 62 63 64 | "6856 "6716 "6570 "6418 "6259 | 6842 6702 6556 6403 6243 | 6828 6687 6541 6387 6227 | 6814 6673 6526 6371 6210 | 6801 6659 6510 6356 6194 | 6787 6644 6495 6340 6177 | 6773 6629 6480 6324 6161 | 6759 6615 6465 6308 6144 | 6744 6600 6449 6292 6127 | 6730 6585 6434 6276 6110 | 2 2 3 3 3 | 5 5 5 6 | 7 7 8 8 8 | 9 10 10 11 11 | 12 12 13 13 14 |
| 1·152 1·169 1·187 1·204 1·222 | 67 68 | ".'6093 ".'5919 ".'5736 ".'5543 ".'5341 | 6076 5901 5717 5523 5320 | 6059 5883 5698 5504 5299 | 6042 5865 5679 5484 5278 | 6024 5847 5660 5463 5256 | 6007 5828 5641 5443 5235 | 5990 5810 5621 5423 5213 | 5972 5792 5602 5402 5192 | 5954 5773 5583 5382 5170 | 5937 5754 5563 5361 5148 | 3 3 4 | 6 6 7 7 | 9 10 10 11 | 12 12 13 14 14 | 15 15 16 17 18 |
| 1·239 1·257 1·274 1·292 1·309 | 71 72 73 74 75 | 11.5126 11.4900 11.4659 11.4403 11.4130 | 5104 4876 4634 4377 4102 | 5082 4853 4609 4350 4073 | 5060 4829 4584 4323 4044 | 5037 4805 4559 4296 4015 | 5015 4781 4533 4269 3986 | 4992 4757 4508 4242 3957 | 4969 4733 4482 4214 3927 | 4946 4709 4456 4186 3897 | 4923 4684 4430 4158 3867 | 4 4 4 5 5 | 8 8 9 9 10 | 11 12 13 14 15 | 15 16 17 18 20 | 19 20 21 23 24 |
| 1·326 1·344 1·361 1·379 1·396 | 77 78 79 | 11°3837 11°3521 11°3179 11°2806 11°2397 | 3806 3488 3143 2767 2353 | 3775 3455 3107 2727 2310 | 3745 3421 3070 2687 2266 | 3713 3387 3034 2647 2221 | 3682 3353 2997 2606 2176 | 3650 3319 2959 2565 2131 | 3618 3284 2921 2524 2085 | 3586 3250 2883 2482 2038 | 3554 3214 2845 2439 1991 | 5 6 6 7 8 | 11 11 12 14 15 | 16 17 19 20 23 | 21 23 25 27 30 | 26 28 31 34 38 |
| 1.414 1.431 1.449 1.466 1.484 | 81 82 83 84 85 | 11.1943 11.1436 11.0859 11.0192 2.9403 | 1895 1381 0797 0120 93 1 5 | 1847 1326 0734 0046 9226 | 1797 1271 0670 9970 9135 | 1747 1214 0605 9894 9042 | 1697 1157 0539 9816 8946 | 1646 1099 0472 9736 8849 | 1594 1040 0403 9655 8749 | 1542 0981 0334 9573 8647 | 1489 0920 0264 9489 8543 | 8 10 11 13 16 | 17 19 22 26 32 | 25 29 33 39 48 | 34 38 44 52 64 | 42 48 55 65 80 |
| 1.501 1.518 1.536 1.553 1.571 | 86 87 88 89 90 | n°8436 n°7188 n°5428 n°2419 −∞ | 8326 7041 5206 1961 | 8213 6889 4971 1450 | 8098 6731 4723 0870 | 7979 6567 4459 0200 | 7857 6397 4179 9408 | 7731 6220 3880 8439 | 7602 6035 3558 7190 | 7468 5842 3210 5429 | 7330 5640 2832 2419 | | | | | |
| - 1 | | | | | | | | | | 07.40 | | | | | | |

Radian = 0017 | 0035 | 0052 | 0070 | 0087 | 0105 | 0122 | 0140 | 0157

| . 1 | . | | | | - | | İ | | | | | Mo | an I |) i etc | ran | ces. |
|----------------|----------|----------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-----------------------|---------------------|----------|----------|----------|----------|----------|
| Radian. | Degree. | 0′ | 6′ | 12' | 18′ | 24' | 30′ | 36′ | 42' | 48' | 54' | | an I | 71116 | | Ces. |
| Ra | De | 0°·0 | 0°·1 | 0°·2 | 03 | 0°·4 | 0°·5 | 0°·6 | 0°.7 | 0∘.8 | 0°·9 | 1′ | 2′ | 3′ | 4' | 5′ |
| *0000 | 0 | - 00 | 3.2419 | 5429 | 7190 | 8439 | 9409 | <u>0</u> 200 | 0870 | 1450 | <u>1</u> 962 | | - | | | |
| *0000 *0175 | 1 | 2.2419 | 2833 | 3211 | 3559 | 3881 | 4181 | 4461 | 4725 | 4973 | 5208 | | | | | |
| *0349 *0524 | 2 3 | 11.7194 | 5643 7337 | 5845 7475 | 6038 7609 | 6223 7739 | 6401 7865 | 6571 7988 | 6736 8107 | 6894 8223 | 7046 8336 | | | | | |
| ·0698 ·0873 | 5 | 11.8446 11.9420 | 8554 9506 | 8659 9591 | 8762 9674 | 8862 9756 | 8960 9836 | 9056 9915 | 9150 9992 | $\frac{9241}{0068}$ | $\frac{9331}{0143}$ | 16 13 | 32 26 | 48 | 64 53 | 81 66 |
| | | | | | | | | | | | | | | | | |
| ·1047 ·1222 | 6 | 1.0216 11.0891 | 0289 0954 | 0360 1015 | 0430 1076 | 0499 1135 | 0567 1194 | 0633 1252 | 0699 1310 | 0764 1367 | 0828 1423 | 11 | 22 20 | 34 29 | 45 39 | 56 49 |
| ·1396 ·1571 | 8 | 11478 | 1533 2046 | 1587 2094 | 1640 2142 | 1693 2189 | 1745 2236 | 1797 2282 | 1848 2328 | 1898 2374 | 1948 2419 | 9 | 17 16 | 26 23 | 35 31 | 43 39 |
| ·1745 | 10 | 11.2463 | 2507 | 2551 | 2594 | 2637 | 2680 | 2722 | 2764 | 2805 | 2846 | 7 | 14 | 21 | 28 | 35 |
| *1920 *2094 | 11 12 | 11.2887 | 2927 3312 | 2967 3349 | 3006 3385 | 3046 3422 | 3085 3458 | 3123 3493 | 3162 3529 | 3200 3564 | 3237 3599 | 6 | 13 12 | 19 18 | 26 24 | 32 30 |
| •2269 | 13 | 11*3634 | 3568 4000 | 3702 | 3736 | 3770 4095 | 3804 4127 | 3837 | 3870 | 3903 | 3935 | 6 5 | 11 | 17 16 | 22 21 | 28 |
| ·2443 ·2618 | 14 15 | 11.4281 | 4311 | 4032 | 4064 4371 | 4400 | 4430 | 4158 4459 | 4189 4488 | 4220 4517 | 4250 4546 | 5 | | 15 | 20 | 26 25 |
| •2793 | 16 | ···4575 | 4603 | 4632 | 4660 | 4688 | 4716 | 4744 | 4771 | 4799 | 4826 | 5 | 9 | 14 | 19 | 23 |
| ·2967 ·3142 | 17 18 | 11.4853 11.5118 | 4880 5143 | 4907 5169 | 4934 5195 | 4961 5220 | 4987 5245 | 5014 5270 | 5040 5295 | 5066 5320 | 5092 5345 | 4 | 9 | 13 13 | 18 17 | 22 21 |
| *3316 *3491 | 19 20 | 11.5370 11.5611 | 5394 5634 | 5419 5658 | 5443 5681 | 5467 5704 | 5491 5727 | 5516 5750 | 5539 5773 | 5563 5796 | 5587 5819 | 4 | 8 | 12 12 | 16 15 | 20 19 |
| | 21 | ıı·5842 | F004 | 5887 | 5909 | 5932 | 5954 | 5976 | 5998 | 6020 | 6042 | | 7 | 11 | 15 | 10 |
| *3665 *3840 | 22 | 11.6064 | 5864 6086 | 6108 | 6129 | 6151 | 6172 | 6194 | 6215 | 6236 | 6257 | 4 | 7 | 11 | 15 | 19 18 |
| *4014 *4189 | 23 24 | 11.6279 11.6486 | 6300 6506 | 6321 6527 | 6341 6547 | 6362 6567 | 6383 6587 | 6404 6607 | 6424 6627 | 6445 6647 | 6465 6667 | 3 | 7 | 10 10 | 14 13 | 17 17 |
| *4363 | 25 | ···6687 | 6706 | 6726 | 6746 | 6765 | 6785 | 6804 | 6824 | 6843 | 6863 | 3 | 7 | 10 | 13 | 16 |
| *4538 *4712 | 25 27 | 11.6882 11.7072 | 6901 | 6920 7109 | 6939 7128 | 6958 7146 | 6977 7165 | 6996 7183 | 7015 7202 | 7034 7220 | 7053 7238 | 3 3 | 6 | 9 | 13 12 | 16 15 |
| ·4887 ·5061 | 28 29 | 11.7257 11.7438 | 7275 7455 | 7293 7473 | 7311 7491 | 7330 7509 | 7348 7526 | 7366 7544 | 7384 7562 | 7402 7579 | 7420 7597 | 3 | 6 | 9 | 12 12 | 15 15 |
| •5236 | 30 | 1.7614 | 7632 | 7649 | 7667 | 7684 | 7701 | 7719 | 7736 | 7753 | 7771 | 3 | 6 | 9 | 12 | 14 |
| •5411 | 31 | 7788 | 7805 | 7822 | 7839 | 7856 | 7873 | 7890 | 7907 | 7924 | 7941 | 3 | 6 | 9 | 11 | 14 |
| *5585 *5760 | 32 | n 7958 | 7975 8142 | 7992 8158 | 8008 8175 | 8025 8191 | 8042 8208 | 8059 8224 | 8075 8241 | 8092 8 2 57 | 8109 8274 | 3 3 | 6 | 8 | 11 11 | 14 14 |
| •5934 •6109 | 34 | 11.8290 11.8452 | 8306 8468 | 8323 8484 | 8339 8501 | 8355 8517 | 8371 8533 | 8388 8549 | 8404 8565 | 8420 8581 | 8436 8597 | 3 | 5 | 8 | 11 11 | 14 13 |
| •6283 | 36 | u·8613 | 8629 | 8644 | 8660 | 8676 | 8692 | 8708 | 8724 | 8740 | 8755 | 3 | 5 | 8 | 11 | 13 |
| ·6458 ·6632 | 37 38 | "·8771 "·8928 | 8787 8944 | 8803 8959 | 8818 8975 | 8834 8990 | 8850 9006 | 8865 9022 | 8881 9037 | 8897 9053 | 8912 9068 | 3 3 | 5 | 8 | 10 | 13 13 |
| *6807 *6981 | 39 40 | 11.9084 | 9099 | 9115 9269 | 9130 9284 | 9146 9300 | 9161 9315 | 9176 9330 | 9192 9346 | 9207 9361 | 9223 9376 | 3 3 | 5 | 8 | 10 | 13 13 |
| 0981 | 10 | | 9204 | | | 9300 | 9313 | | | 9301 | | | Ü | Ī | | |
| ·7156 •7330 | 41 42 | 11°9392 11°9544 | 9407 9560 | 9422 9575 | 9438 9590 | 9453 9605 | 9468 9621 | 9483 9636 | 9499 9651 | 9514 9666 | 9529 9681 | 3 | 5 5 | 8 | 10 10 | 13 13 |
| ·7505 •7679 | 43 44 | 11.9697 11.9848 | 9712 9864 | 9727 9879 | 9742 9894 | 9757 9909 | 9773 9924 | 9788 9939 | 9803 9955 | 9818 9970 | 9833 9985 | 3 3 | 5 5 | 8 | 10 10 | 13 13 |
| 7854 | 45 | 0.0000 | 0015 | 0030 | 0045 | 0061 | 0076 | 0091 | 0106 | 0121 | 0136 | 3 | 5 | 8 | 10 | 13 |
| 1 | - | | ' | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | i | | | - | 4 |

Radian = 0017 0035 0052 0070 0087 0105 0122 0140 0157

| Radian. | ree. | 0′ | 6' | 12' | 18" | 24' | 30′ | 36′ | 42' | 48' | 54' | M | ean i | Diffe | renc | es. |
|--------------|----------|------------------|-----------------------|--------------|--------------|--------------|--------------|----------------|----------------|--------------|--------------------------|----------|-----------------|----------|------------|----------|
| Rad | Degree. | 0°·0 | 0°·1 | 0°·2 | 0°.3 | 0°·4 | 0°.5 | 0°·6 | 0°·7 | 08 | 0°·9 | .1' | 2′ | 3′ | 4' | 5 |
| 785 | 45 | .0000 | 0015 | 0030 | 0045 | 0061 | 0076 | 0091 | 0106 | 0121 | 0136 | 3 | . 5 | 8 | 10 | 13 |
| ·803 | 46 47 | ·0152 ·0303 | 0167 0319 | 0182 0334 | 0197 | 0212 | 0228 | 0243 | 0258 | 0273 0425 | 0288 0440 | 3 | 5 | 8 | 10 | 13 13 |
| *838 *855 | 48 | '0456 | 0471 | 0486 | 0501 | 0517 0670 | 0532 0685 | 0547 | 0562 0716 | 0578 0731 | 0593 0746 | 3 | 5 | 8 | 10 10 | 18 |
| ·873 | 49 50 | ·0608 ·0762 | 0624 | 0639 0793 | 0654 0808 | 0824 | 0839 | 0700 0854 | 0870 | 0885 | 0901 | 3 | 5 | 8 | 10 | 18 |
| ·890 ·908 | 51 52 | ·0916 ·1072 | 0932 1088 | 0347 1103 | 0963 1119 | 0978 1135 | 0994 1150 | 1010 1166 | 1025 1182 | 1041 1197 | 1056 1213 | 3 | 5 | 8 | 10 10 | 13 |
| 925 | 53 | 1229 | 1245 | 1260 | 1276 | 1292 | 1308 | 1324 | 1340 | 1356 | 1371 | 3 | 5 | 8 | 11 | 1; |
| •942 •960 | 54 55 | 1387 1548 | 1403 1564 | 1419 1580 | 1435 1596 | 1451 1612 | 1467 1629 | 1483 1645 | 1499 1661 | 1516 1677 | 1532 1694 | 3 | 5 5 | 8 | 11 11 | 1: |
| •977 •995 | 56 57 | ·1710 ·1875 | 1726 1891 | 1743 1908 | 1759 1925 | 1776 1941 | 1792 1958 | 1809 1975 | 1825 1992 | 1842 2008 | 1858 2025 | 3 | 5 | 8 | 11 11 | 14 |
| 012 | 58 | *2042 | 2059 | 2076 | 2093 | 2110 | 2127 | 2144 | 2161 | 2178 | 2195 | 3 | 6 | 9 | 11 | 14 |
| ·030 ·047 | 59 60 | ·2212 ·2386 | 2229 2403 | 2247 2421 | 2264 2438 | 2281 2456 | 2299 2474 | 2316 2491 | 2333 2509 | 2351 2527 | 2368 2545 | 3 | 6 | 9 | 12 12 | 1: |
| *065 *082 | 61 62 | *2562 *2743 | 2580 2762 | 2598 2780 | 2616 2798 | 2634 2817 | 2652 2835 | 2670 2854 | 2689 2872 | 2707 2891 | 2725 2910 | 3 | 6 | 9 | 12 12 | 18 |
| .100 | 63 | *2928 | 2947 | 2966 | 2985 | 3004 | 3023 | 3042 | 3061 | 3080 | 3099 | 3 | 6 | 9 | 13 | 1 |
| ·117 ·134 | 64 65 | *3118 *3313 | 3137 3333 | 3157 3353 | 3176 3373 | 3196 3393 | 3215 3413 | 3235 3433 | 3254 3453 | 3274 3473 | 3294 3494 | 3 | 6 | 10 10 | 13 13 | 1 |
| ·152 | 66 67 | 3514 3721 | 3535 3743 | 3555 3764 | 3576 3785 | 3596 3806 | 3617 3828 | 3638 3849 | 3659 3871 | 3679 3892 | 3700 3914 | 3 | - 7 | 10 | 14 | 1 |
| 187 | 68 | *3936 | 3958 | 3980 | 4002 | 4024 | 4046 | 4068 | 4091 | 4113 | 4136 | 4 | 7 | 11 11 | 14 15 | 1: |
| ·204 ·222 | 69 70 | *4158 *4389 | 4181 4413 | 4204 4437 | 4227 4461 | 4250 4484 | 4273 4509 | 4296 4533 | 4319 4557 | 4342 4581 | 4366 4606 | 4 | 8 | 12 12 | 15 16 | 20 |
| 239 | 71 | *4630 | 4655 | 4680 | 4705 | 4730 | 4755 | 4780 | 4805 | 4831 5093 | 4857 5120 | 4 | 8 | 13 | 17 | 2 |
| ·257 | 72 73 | *4882 *5147 | 4908 5174 | 4934 5201 | 4960 5229 | 4986 5256 | 5013 5284 | 5039 5312 | 5066 5340 | 5368 | 5397 | 5 | 9 | 13 14 | 18 19 | 2: |
| ·292 ·309 | 74 75 | *5425 *5719 | 5454 5750 | 5483 5780 | 5512 5811 | 5541 5842 | 5570 5873 | 5600 5905 | 5629 5936 | 5659 5968 | 5689 6000 | 5 | 10 10 | 15 16 | 20 21 | 20 |
| 326 | 76 | ·6032 | 6065 | 6097 6436 | 6130 | 6163 | 6196 | 6230 6578 | 6264 | 6298 6651 | 6332 6688 | 6 | 11 | 7.4 | 22 | 28 |
| ·344 ·361 | 77 78 | *6366 *6725 | 6401 6763 | 6800 | 6471 6838 | 6507 6877 | 6542 6915 | 6954 | 6615 6994 | 7033 | 7073 | 6 | 12 13 | 18 19 | 26 | 3: |
| ·379 ·396 | 79 80 | •7113 •7537 | 7154 7581 | 7195 7626 | 7236 7672 | 7278 7718 | 7320 7764 | 7363 7811 | 7406 7858 | 7449 7906 | 7493 7954 | 7 8 | 14 16 | 21 23 | 28 31 | 38 |
| 414 | 81 82 | *8003 *8522 | 8052 8577 | 8102 8633 | 8152 8690 | 8203 8748 | 8255 8806 | 8307 8865 | 8360 8924 | 8413 8985 | 8467 9046 | 9 | 17 20 | 26 29 | 35 · 39 | 43 |
| ·431 ·449 | 83 | 9109 | 9172 | 9236 | 9301 | 9367 | 9433 | 9501 | 9570 | 9640 | 9711 | 11 | 12 | 34 | 45 | 56 |
| ·466 ·484 | 84 85 | 9784 1 0580 | 9857 0 6 69 | 9932 0759 | 0008 0850 | 0085 0944 | 0164 1040 | $0244 \\ 1138$ | $0326 \\ 1238$ | 0409 1341 | $\overline{0494}$ 1446 | 13 16 | $\frac{26}{32}$ | 40 48 | 53 64 | 81 |
| •501 | 86 | 1.1554 | 1664 | 1777 | 1893 | 2012 | 2135 | 2261 | 2391 | 2525 | 2663 | | | | | |
| ·518 ·536 | 87 88 | 1.2806 1.4569 | 2954 4792 | 3106 5027 | 3264 5275 | 3429 5539 | 3599 5819 | 3777 6119 | 3962 6441 | 4155 6789 | 4357 7167 | | | | | 1 |
| ·553 ·571 | 89 90 | 1.7581 +∞ | 8038 | 8550 | 9130 | 9800 | 0591 | 1561 | 2810 | 4571 | $\overline{7}581$ | | | | | |

Radian = 0017 | 0035 | 0052 | 0070 | 0087 | 0105 | 0122 | 0140 | 0157 |

| Radian. | ree. | 0′ | 6' | 12' | 18' | 24' | 30′ | 36′ | 42' | 48' | 54' | Me | an I | Diffe | renc | es. |
|--|----------------------------|--|--|--|--|--|--|--|--|--|--|----------------------------|-----------------------|-----------------------|--|----------------------------------|
| Rad | Degree. | 0°·0 | 0°·1 | 0°·2 | 0°·3 | 0°·4 | 0°·5 | 0°·6 | 0°·7 | 0°·8 | 0°∙9 | 1' | 2′ | 3′ | 4' | 5′ |
| *0000 *0175 *0349 *0524 *0698 *0873 | 0 1 2 3 4 5 | *0000 *0175 *0349 *0523 *0698 *0872 | 0017 0192 0366 0541 0715 0889 | 0035 0209 0384 0558 0732 0906 | 0052 0227 0401 0576 0750 0924 | 0070 0244 0419 0593 0767 0941 | 0087 0262 0436 0610 0785 0958 | 0105 0279 0454 0628 0802 0976 | 0122 0297 0471 0645 0819 0993 | 0140 0314 0488 0663 0837 1011 | 0157 0332 0506 0680 0854 1028 | 3 3 3 3 3 | 6 6 6 6 6 | 9 9 9 9 9 | 12 12 12 12 12 12 12 | 15 15 15 15 14 14 |
| *1047 *1222 *1396 *1571 *1745 | 6 7 8 9 10 | *1045 *1219 *1392 *1564 *1736 | 1063 1236 1409 1582 1754 | 1080 1253 1426 1599 1771 | 1097 1271 1444 1616 1788 | 1115 1288 1461 1633 1805 | 1132 1305 1478 1650 1822 | 1149 1323 1495 1668 1840 | 1167 1340 1513 1685 1857 | 1184 1357 1530 1702 1874 | 1201 1374 1547 1719 1891 | 3 3 3 3 | 6 6 6 6 | 9 9 9 9 | 12 12 12 12 12 11 | 14 14 14 14 14 |
| *1920 *2094 *2269 *2443 *2618 | 11 12 13 14 15 | 1908 2079 2250 2419 2588 | 1925 2096 2267 2436 2605 | 1942 2113 2284 2453 2622 | 1959 2130 2300 2470 2639 | 1977 2147 2317 2487 2656 | 1994 2164 2334 2504 2672 | 2011 2181 2351 2521 2689 | 2028 2198 2368 2538 2706 | 2045 2215 2385 2554 2723 | 2062 2233 2402 2571 2740 | 3 3 3 3 | 6 6 6 6 | 9 9 8 8 8 | 11 11 11 11 11 | 14 14 14 14 14 |
| •2793 •2967 •3142 •3316 •3491 | 16 17 18 19 20 | ·2756 ·2924 ·3090 ·3256 ·3420 | 2773 2940 3107 3272 3437 | 2790 2957 3123 3289 3453 | 2807 2974 3140 3305 3469 | 2823 2990 3156 3322 3486 | 2840 3007 3173 3338 3502 | 2857 3024 3190 3355 3518 | 2874 3040 3206 3371 3535 | 2890 3057 3223 3387 3551 | 2907 3074 3239 3404 3567 | 3 3 3 3 | 6 6 5 5 | 8 8 8 8 | 11 11 11 11 11 | 14 14 14 14 14 |
| 3665 3840 4014 4189 4363 | 21 22 23 24 25 | *3584 *3746 *3907 *4067 *4226 | 3600 3762 3923 4083 4242 | 3616 3778 3939 4099 4258 | 3633 3795 3955 4115 4274 | 3649 3811 3971 4131 4289 | 3665 3827 3987 4147 4305 | 3681 3843 4003 4163 4321 | 3697 3859 4019 4179 4337 | 3714 3875 4035 4195 4352 | 3730 3891 4051 4210 4368 | 3 3 3 3 | 5 5 5 5 5 | 8 8 8 8 | 11 11 11 11 11 | 14 14 14 13 13 |
| •4538 •4712 •4887 •5061 •5236 | 26 27 28 29 30 | *4384 *4540 *4695 *4848 *5000 | 4399 4555 4710 4863 5015 | 4415 4571 4726 4879 5030 | 4431 4586 4741 4894 5045 | 4446 4602 4756 4909 5060 | 4462 4617 4772 4924 5075 | 4478 4633 4787 4939 5090 | 4493 4648 4802 4955 5105 | 4509 4664 4818 4970 5120 | 4524 4679 4833 4985 5135 | 3 3 3 3 | 5 5 5 5 5 | 8 8 8 8 | 10 10 10 10 10 | 13 13 13 13 13 |
| *5411 *5585 *5760 *5934 *6109 | 31 32 33 34 35 | *5150 *5299 *5446 *5592 *5736 | 5165 5314 5461 5606 5750 | 5180 5329 5476 5621 5764 | 5195 5344 5490 5635 5779 | 5210 5358 5505 5650 5793 | 5225 5373 5519 5664 5807 | 5240 5388 5534 5678 5821 | 5255 5402 5548 5693 5835 | 5270 5417 5563 5707 5850 | 5284 5432 5577 5721 5864 | 2 2 2 2 2 | 5 5 5 5 | 7 7 7 7 | 10 10 10 10 9 | 12 12 12 12 12 12 |
| ·6283 ·6458 ·6632 ·6807 ·6981 | 36 37 38 39 40 | *5878 *6018 *6157 *6293 *6428 | 5892 6032 6170 6307 6441 | 5906 6046 6184 6320 6455 | 5920 6060 6198 6334 6468 | 5934 6074 6211 6347 6481 | 5948 6088 6225 6361 6494 | 5962 6101 6239 6374 6508 | 5976 6115 6252 6388 6521 | 5990 6129 6266 6401 6534 | 6004 6143 6280 6414 6547 | 2 2 2 2 2 | 5 5 5 4 4 | 7 7 7 7 | 9 9 9 | 12 12 11 11 11 |
| *7156 *7330 *7505 *7679 *7854 | 41 42 43 44 45 | *6561 *6691 *6820 *6947 *7071 | 6574 6704 6833 6959 7083 | 6587 6717 6845 6972 7096 | 6600 6730 6858 6984 7108 | 6613 6743 6871 6997 7120 | 6626 6756 6884 7009 7133 | 6639 6769 6896 7022 7145 | 6652 6782 6909 7034 7157 | 6665 6794 6921 7046 7169 | 6678 6807 6934 7059 7181 | 2 2 2 2 2 2 | 4 4 4 4 | 7 6 6 6 6 | 9 9 8 8 8 | 11 11 11 10 10 |
| | · Ra | ıdian= | 0017 | 0035 | 0052 | 0070 | 0087 | 0105 | 0122 | 0140 | 0157 | | | • | | |

| an. | ree. | 0' | 6' | 12' | 18' | 24' | 30′ | 36' | 42' | 48' | 54' | Mea | n I | iffe | ren | ices. |
|--|----------------------------------|--|--|--|--|--|--|--|--|--|--|---------------------------------|-----------------------|----------------------------|-----------------------|--------------------------------|
| Radian. | Degree. | 0°.0 | 0°·1 | 0°·2 | 0°.3 | 0°·4 | 0°:5 | 0°·6 | 0°·7 | 0°·8 | 00 | 1' | 2' | 3′ | 4' | 5′ |
| *785 *803 *820 *838 *855 *873 | 45 46 47 48 49 50 | ·7071 ·7193 ·7314 ·7431 ·7547 ·7660 | 7083 7206 7325 7443 7559 7672 | 7096 7218 7337 7455 7570 7683 | 7108 7230 7349 7466 7581 7694 | 7120 7242 7361 7478 7593 7705 | 7133 7254 7373 7490 7604 7716 | 7145 7266 7385 7501 7615 7727 | 7157 7278 7396 7513 7627 7738 | 7169 7290 7408 7524 7638 7749 | 7181 7302 7420 7536 7649 7760 | 2 2 2 2 2 2 2 | 4 4 4 4 4 | 6 6 6 6 6 | 8 | 10 10 10 10 9 9 |
| *890 *908 *925 *942 *960 | 51 52 53 54 55 | ·7771 ·7880 ·7986 ·8090 ·8192 | 7782 7891 7997 8100 8202 | 7793 7902 8007 8111 8211 | 7804 7912 8018 8121 8221 | 7815 7923 8028 8131 8231 | 7826 7934 8039 8141 8241 | 7837 7944 8049 8151 8251 | 7848 7955 8059 8161 8261 | 7859 7965 8070 8171 8271 | 7869 7976 8080 8181 8281 | 2 2 2 2 2 2 | 4 3 3 3 | 5 5 5 5 5 | 7 7 7 7 | 9 9 9 8 8 |
| *977 *995 1 012 1 030 1 047 | 56 57 58 59 60 | *8290 *8387 *8480 *8572 *8660 | 8300 8396 8490 8581 8669 | 8310 8406 8499 8590 8678 | 8320 8415 8508 8599 8686 | 8329 8425 8517 8607 8695 | 8339 8434 8526 8616 8704 | 8348 8443 8536 8625 8712 | 8358 8453 8545 8634 8721 | 8368 8462 8554 8643 8729 | 8377 8471 8563 8652 8738 | 2 2 2 1 1 | 3 3 3 3 | 5 5 4 4 | 6 6 6 6 | 8 8 8 7 7 |
| 1.065 1.082 1.100 1.117 1.134 | 61 62 63 64 65 | *8746 *8829 *8910 *8988 *9063 | 8755 8838 8918 8996 9070 | 8763 8846 8926 9003 9078 | 8771 8854 8934 9011 9085 | 8780 8862 8942 9018 9092 | 8788 8870 8949 9026 9100 | 8796 8878 8957 9033 9107 | 8805 8886 8965 9041 9114 | 8813 8894 8973 9048 9121 | 8821 8902 8980 9056 9128 | 1 1 1 1 | 3 3 3 2 | 4 4 4 4 | 6 5 5 5 5 | 7 7 6 6 6 |
| 1·152 1·169 1·187 1·204 1·222 | 66 67 68 69 70 | ·9135 ·9205 ·9272 ·9336 ·9397 | 9143 9212 9278 9342 9403 | 9150 9219 9285 9348 9409 | 9157 9225 9291 9354 9415 | 9164 9232 9298 9361 9421 | 9171 9239 9304 9367 9426 | 9178 9245 9311 9373 9432 | 9184 9252 9317 9379 9438 | 9191 9259 9323 9385 9444 | 9198 9265 9330 9391 9449 | 1 1 1 1 | 2 2 2 2 2 | 3 3 3 3 | 5 4 4 4 4 | 6 6 5 5 5 |
| 1·239 1·257 1·274 1·292 1·309 | 71 72 73 74 75 | *9455 *9511 *9563 *9613 *9659 | 9461 9516 9568 9617 9664 | 9466 9521 9573 9622 9668 | 9472 9527 9578 9627 9673 | 9478 9532 9583 9632 9677 | 9483 9537 9588 9636 9681 | 9489 9542 9593 9641 9686 | 9494 9548 9598 9646 9690 | 9500 9553 9603 9650 9694 | 9505 9558 9608 9655 9699 | 1 1 1 1 1 | 2 2 2 2 1 | 3 3 2 2 2 2 | 4 3 3 3 3 | 5 4 4 4 4 |
| 1°326 1°344 1°361 1°379 1°396 | 76 77 78 79 80 | ·9703 ·9744 ·9781 ·9816 ·9848 | 9707 9748 9785 9820 9851 | 9711 9751 9789 9823 9854 | 9715 9755 9792 9826 9857 | 9720 9759 9796 9829 9860 | 9724 9763 9799 9833 9863 | 9728 9767 9803 9836 9866 | 9732 9770 9806 9839 9869 | 9736 9774 9810 9842 9871 | 9740 9778 9813 9845 9874 | 1 1 1 1 0 | 1 1 1 1 1 | 2 2 2 2 1 | 3 2 2 2 | 3 3 3 2 |
| 1:414 1:431 1:449 1:466 1:484 | 81 82 83 84 85 | *9877 *9903 *9925 *9945 *9962 | 9880 9905 9928 9947 9963 | 9882 9907 9930 9949 9965 | 9885 9910 9932 9951 9966 | 9888 9912 9934 9952 9968 | 9890 9914 9936 9954 9969 | 9893 9917 9938 9956 9971 | 9895 9919 9940 9957 9972 | 9898 9921 9942 9959 9973 | 9900 9923 9943 9960 9974 | 0 0 0 0 | 1 1 1 1 0 | 1 1 1 1 1 | 2 2 1 1 1 | 2 2 2 2 1 |
| 1.501 1.518 1.536 1.553 1.571 | 86 87 88 89 90 | *9976 *9986 *9994 *9998 1*000 | 9977 9987 9995 9999 | 9978 9988 9995 9999 | 9979 9989 9996 9999 | 9980 9990 9996 9999 | 9981 9990 9997 1 000 | 9982 9991 9997 1.000 | 9983 9992 9997 1:000 | 9984 9993 9998 1.000 | 9985 9993 9998 1.000 | 0 0 0 0 | 0 0 0 0 | 1 0 0 0 | 1 1 0 0 | 1 1 0 0 |
| 1·501 1·518 1·536 1·553 | 86 87 88 89 90 | *9976 *9986 *9994 *9998 1*000 | 9977 9987 9995 9999 | 9978 9988 9995 9999 | 9979 9989 9996 9999 | 9980 9990 9996 9999 | 9981 9990 9997 | 9982 9991 9997 1.000 | 9983 9992 9997 | 9984 9993 9998 1.000 | 9985 9993 9998 | 0 0 0 | 0 0 0 | 1 0 0 | 1 1 0 | |

| ian. | ree. | 0′ | 6' | 12' | 18' | 24' | 30′ | 36' | 42' | 48' | 54' | Mea | ın I | Diffe | erei | ices |
|--|----------------------------|--|---|---|---|---|---|---|--|--|--|----------------------------|-----------------------|----------------------------|----------------------------|----------------------------|
| Radian. | Degree. | 0°·0 | 0°·1 | 0°·2 | 0°·3 | 0°·4 | 0°·5 | 0°·6 | 0°·7 | 0°.8 | 0°.9 | 1' | 2' | 3′ | 4' | 5' |
| *0000 *0175 *0349 *0524 *0698 *0873 | 0 1 2 3 4 5 | 1.000 .9998 .9994 .9986 .9976 .9962 | 1.000 9998 9993 9985 9974 9960 | 1·000 9998 9993 9984 9973 9959 | 1·000 9997 9992 9983 9972 9957 | 1.000 9997 9991 9982 9971 9956 | 1.000 9997 9990 9981 9969 9954 | ·9999 9996 9990 9980 9968 9952 | 9999 9996 9989 9979 9966 9951 | 9999 9995 9983 9978 9965 9949 | 9999 9995 9987 9977 9963 9947 | 0 0 0 0 0 | 0 0 0 0 0 | 0 0 0 1 1 1 | 0 0 1 1 1 1 | 0 0 1 1 1 2 |
| :1047 :1222 :1396 :1571 :1745 | 6 7 8 9 10 | *9945 *9925 *9903 *9877 *9848 | 9943 9923 9900 9874 9845 | 9942 9921 9898 9871 9842 | 9947 9919 9895 9869 9839 | 9938 9917 9893 9866 9836 | 9936 9914 9890 9863 9333 | 9934 9912 9888 9860 9829 | 1932 9910 9885 9857 9826 | 9930 9907 9882 9854 9823 | 9928 9905 9880 9851 9820 | 0 0 0 0 1 | 1 1 1 1 | 1 1 1 1 2 | 1 2 2 2 2 | 2 2 2 2 3 |
| *1920 *2094 *2269 *2443 *2618 | 11 12 13 14 15 | *9816 *9781 *9744 *9703 *9059 | 9313 9778 9740 9699 9655 | 9810 9774 9736 9394 9650 | 9806 9770 9732 9695 9646 | 9803 9767 9728 9686 9641 | 9799 9763 9724 9681 9636 | 9796 9759 9720 9677 9632 | 9792 9755 9715 9673 9627 | 9783 9751 9711 9668 9622 | 9785 9748 9707 9664 9617 | 1 1 1 1 | 1 1 1 1 2 | 2 2 2 2 2 | 2 3 3 3 3 | 3 3 4 4 |
| ·2793 ·2937 ·3142 ·3316 ·3491 | 16 17 18 19 20 | *9613 *9563 *9511 *9455 *9397 | 9608 9558 9505 9449 9391 | 9603 9553 9500 9444 9385 | 9598 9548 9494 9438 9379 | 9593 9542 9489 9432 9373 | 9588 9537 9483 9426 9367 | 9583 9532 9478 9421 9361 | 9578 9527 9472 9415 9354 | 9573 9521 9466 9409 9348 | 9568 9516 9461 9403 9342 | 1 1 1 1 1 | 2 2 2 2 2 | 2 3 3 3 3 | 3 4 4 4 | 4 4 5 5 5 |
| *3665 *3840 *4014 *4189 *4363 | 21 22 23 24 25 | *9336 *9272 *9205 *9135 *9063 | 9330 9265 9198 9128 9056 | 9323 9259 9191 9121 9048 | 9317 9252 9184 9114 9041 | 9311 9245 9178 9107 9033 | 9304 9239 9171 9100 9026 | 9298 9232 9164 9092 9018 | 9291 9225 9157 9085 9011 | 9285 9219 9150 9078 9003 | 9278 9212 9143 9070 8996 | 1 1 1 1 | 2 2 2 2 3 | 3 3 4 4 | 4 4 5 5 5 | 5 6 6 6 |
| *4538 *4712 *4387 *5061 *5236 | 26 27 28 29 30 | *8988 *8910 *8829 *8746 *8660 | 8980 8902 8821 8738 8652 | 8973 8894 8813 8729 8643 | 8965 8886 8805 8721 8634 | 8957 8878 8796 8712 8625 | 8949 8870 8788 8704 8616 | 8942 8862 8780 8695 8607 | 8934 8854 8771 8686 8509 | 8926 8846 8763 8678 8590 | 8918 8838 8755 8669 8581 | 1 1 1 1 | 3 3 3 3 3 | 4 4 4 4 | 5 5 6 6 | 6 7 7 7 |
| *5411 *5585 *5760 *5934 *6109 | 31 32 33 34 35 | *8572 *8480 *8387 *8290 *8192 | 8563 8471 8377 8281 8181 | 8554 8462 8368 8271 8171 | 8545 8453 8358 8261 8161 | 8536 8443 8348 8251 8151 | 8526 8434 8539 8241 8141 | 8517 8425 8329 8231 8131 | 8508 8415 8320 8221 8121 | 8499 8406 8310 8211 8111 | 8490 8396 8300 8202 8100 | 2 2 2 2 2 2 | 3 3 3 3 | 5 5 5 5 | 6 6 7 7 | 8 8 8 8 8 |
| *6283 *6458 *6632 *6807 *6981 | 36 37 38 39 40 | ·8090 ·7986 ·7880 ·7771 ·7660 | 8080 7976 7869 7760 7649 | 8070 7965 7859 7749 7638 | 8059 7955 7848 7738 7627 | 8049 7944 7837 7727 7615 | 8039 7934 7826 7716 7604 | 8028 7923 7815 7705 7593 | 8018 7912 7804 7694 7581 | 8007 7902 7793 7683 7570 | 7997 7891 7782 7672 7559 | 2 2 2 2 2 2 | 3 4 4 4 4 | 5 5 6 6 | 7 7 7 8 | 9 9 9 |
| *7156 *7330 *7505 *7679 *7854 | 41 42 43 44 45 | *7547 *7431 *7314 *7193 *7071 | 7536 7420 7302 7181 7059 | 75?4 7408 7290 7169 7046 | 7513 7396 7278 7157 7034 | 7501 7385 7266 7145 7022 | 7490 7373 7254 7133 7009 | 7478 7361 7242 7120 6997 | 7466 7349 7230 7108 6984 | 7455 7337 7218 7096 6972 | 7443 7325 7206 7083 6959 | 2 2 2 2 2 2 | 4 4 4 4 | 6 6 6 6 | 8 | 10 10 10 10 10 |
| •7505 •7679 | 43 44 45 | ·7314 ·7193 ·7071 | 7302 7181 | 7290 7169 7046 | 7278 7157 7034 | 7266 7145 7022 | 7254 7133 | 7242 7120 6997 | 7230 7108 6984 | 7218 7096 6972 | 7206 7083 6959 | 2 2 2 | 4 | 6 | 8 | 3 |

| ian. | ree. | 0′ | 6' | 12' | 18′ | 24' | 30′ | 36′ | 42' | 48' | 54' | Me | an l | Diffe | erene | ces. |
|--|----------------------------------|--|--|--|--|--|--|--|--|--|--|----------------------------|-----------------------|------------------|----------------------------------|----------------------------------|
| Radian. | Degree. | 0°·0 | 0°·1 | 0°·2 | 0,.3 | 0°•4 | 0°.5 | 0°·6 | 0°-7 | 0°.8 | 0°-9 | 1' | 2′ | 3′ | 4' | 5' |
| *785 *803 *820 *838 *855 *873 | 45 46 47 48 49 50 | '7071 '6947 '6820 '6691 '6561 '6428 | 7059 6934 6807 6678 6547 6414 | 7046 6921 6794 6665 6534 6401 | 7034 6909 6782 6652 6521 6388 | 7022 6896 6769 6639 6508 6374 | 7009 6884 6756 6626 6494 6361 | 6997 6871 6743 6613 6481 6347 | 6984 6858 6730 6600 6468 6334 | 6972 6845 6717 6587 6455 6320 | 6959 6833 6704 6574 6441 6307 | 2 2 2 2 2 2 | 4 4 4 4 4 | 6 6 7 7 | 8 8 9 9 9 | 10 11 11 11 11 11 |
| *890 *908 *925 *942 *960 | 51 52 53 54 55 | ·6293 ·6157 ·6018 ·5878 •5736 | 6280 6143 6004 5864 5721 | 6266 6129 5990 5850 5707 | 6252 6115 5976 5835 5693 | 6239 6101 5962 5821 5678 | 6225 6088 5948 5807 5664 | 6211 6074 5934 5793 5650 | 6198 6060 5920 5779 5635 | 6184 6046 5906 5764 5621 | 6170 6032 5892 5750 5606 | 2 2 2 2 2 | 5 5 5 5 | 7 7 7 7 | 9 9 9 9 | 11 12 12 12 12 12 |
| .977 .995 1.012 1.030 1.047 | 56 57 58 59 60 | *5592 *5446 *5299 *5150 *5000 | 5577 5432 5284 5135 4985 | 5563 5417 5270 5120 4970 | 5548 5402 5255 5105 4955 | 5534 5388 5240 5090 4939 | 5519 5373 5225 5075 4924 | 5505 5358 5210 5060 4909 | 5490 5344 5195 5045 4894 | 5476 5329 5180 5030 4879 | 5461 5314 5165 5015 4863 | 2 2 2 3 3 | 5 5 5 5 | 7 7 8 8 | 10 10 10 10 10 | 12 12 12 13 13 |
| 1.065 1.082 1.100 1.117 1.134 | 61 62 63 64 65 | ·4848 ·4695 ·4540 ·4384 ·4226 | 4833 4679 4524 4368 4210 | 4818 4664 4509 4352 4195 | 4802 4648 4493 4337 4179 | 4787 4633 4478 4321 4163 | 4772 4617 4462 4305 4147 | 4756 4602 4446 4289 4131 | 4741 4586 4431 4274 4115 | 4726 4571 4415 4258 4099 | 4710 4555 4399 4242 4083 | 3 3 3 3 | 5 5 5 5 5 | 888888 | 10 10 10 11 11 | 13 13 13 13 13 |
| 1·152 1·169 1·187 1·204 1·222 | 66 67 68 69 70 | *4067 *3907 *3746 *3584 *3420 | 4051 3891 3730 3567 3404 | 4035 3875 3714 3551 3387 | 4019 3859 3697 3535 3371 | 4003 3843 3681 3518 3355 | 3987 3827 3665 3502 3338 | 3971 3811 3649 3486 3322 | 3955 3795 3633 3469 3305 | 3939 3778 3616 3453 3289 | 3923 3762 3600 3437 3272 | 3 3 3 3 | 5 5 5 5 | 8 8 8 8 8 | 11 11 11 11 11 | 14 14 14 14 14 |
| 1·239 1·257 1·274 1·292 1·309 | 71 72 73 74 75 | *3256 *3090 *2924 *2756 *2588 | 3239 3074 2907 2740 2571 | 3223 3057 2890 2723 2554 | 3206 3040 2874 2706 2538 | 3190 3024 2857 2689 2521 | 3173 3007 2840 2672 2504 | 3156 2990 2823 2656 2487 | 3140 2974 2807 2639 2470 | 3123 2957 2790 2622 2453 | 3107 2940 2773 2605 2436 | 3 3 3 3 | 6 6 6 6 | 8 8 8 8 | 11 11 11 11 11 | 14 14 14 14 14 |
| 1·326 1·344 1·361 1·379 1·396 | 76 77 78 79 80 | *2419 *2250 *2079 *1908 *1736 | 2402 2233 2062 1891 1719 | 2385 2215 2045 1874 1702 | 2368 2198 2028 1857 1685 | 2351 2181 2011 1840 1668 | 2334 2164 1994 1822 1650 | 2317 2147 1977 1805 1633 | 2300 2130 1959 1788 1616 | 2284 2113 1942 1771 1599 | 2267 2096 1925 1754 1582 | 3 3 3 3 | 6 6 6 6 | 8 9 9 9 | 11 11 11 11 11 12 | 14 14 14 14 14 |
| 1·414 1·431 1·449 1·466 1·484 | 81 82 83 84 85 | ·1564 ·1392 ·1219 ·1045 ·0872 | 1547 1374 1201 1028 0854 | 1530 1357 1184 1011 0837 | 1513 1340 1167 0993 0819 | 1495 1323 1149 0976 0802 | 1478 1305 1132 0958 0785 | 1461 1288 1115 0941 0767 | 1444 1271 1097 0924 0750 | 1426 1253 1080 0906 0732 | 1409 1236 1063 0889 0715 | 3 3 3 3 | 6 6 6 6 | 9 9 9 9 | 12 12 12 12 12 12 | 14 14 14 14 14 |
| 1.501 1.518 1.536 1.553 1.571 | 86 87 88 89 90 | *0698 *0523 *0349 *0175 *0000 | 0680 0506 0332 0157 | 0663 0488 0314 0140 | 0645 0471 0297 0122 | 0628 0454 0279 0105 | 0610 0436 0262 0087 | 0593 0419 0244 0070 | 0576 0401 0227 0052 | 0558 0384 0209 0035 | 0541 0366 0192 0017 | 3 3 3 | 6 6 6 | 9 9 9 | 12 12 12 12 | 15 15 15 15 |

Radian = 0017 | 0035 | 0052 | 0070 | 0087 | 0105 | 0122 | 0140 | 0157

| Radian. | Degree. | 0′ | 6' | 12′ | 18' | 24' | 30′ | 36′ | 42' | 48' | 54' | M | ean | Diffe | eren | es. |
|--|----------------------------|--|--|--|--|--|--|--|--|--|--|------------------|----------------------------------|----------------------------|----------------------------------|----------------------------|
| Rad | Deg | 0,.0 | 0°·1 | 0°·2 | 0°·3 | 0°4 | 0°·5 | 0°·6 | 0°•7 | 0°·8 | 0°•9 | 1' | 2′ | 3′ | 4' | 5′ |
| 0000 0175 0349 0524 0698 0873 | 0 1 2 3 4 5 | *0000 *0175 *0349 *0524 *0699 *0875 | 0017 0192 0367 0542 0717 0892 | 0035 0209 0384 0559 0734 0910 | 0052 0227 0402 0577 0752 0928 | 0070 0244 0419 0594 0769 0945 | 0087 0262 0437 0612 0787 0963 | 0105 0279 0454 0629 0805 0981 | 0122 0297 0472 0647 0822 0998 | 0140 0314 0489 0664 0840 1016 | 0157 0332 0507 0682 0857 1033 | 3 3 3 3 3 | 6 6 6 6 6 | 9 9 9 9 9 | 12 12 12 12 12 12 | 15 15 15 15 15 |
| 1047 1222 1396 1571 1745 | 6 7 8 9 10 | *1051 *1228 *1405 *1584 *1763 | 1069 1246 1423 1602 1781 | 1086 1263 1441 1620 1799 | 1104 1281 1459 1638 1817 | 1122 1299 1477 1655 1835 | 1139 1317 1495 1673 1853 | 1157 1334 1512 1691 1871 | 1175 1352 1530 1709 1890 | 1192 1370 1548 1727 1908 | 1210 1388 1566 1745 1926 | 3 3 3 | 6 6 6 6 | 9 9 9 | 12 12 12 12 12 | 15 15 15 15 15 |
| 1920 2094 2269 2443 2618 | 11 12 13 14 15 | *1944 *2126 *2309 *2493 *2679 | 1962 2144 2327 2512 2698 | 1980 2162 2345 2530 2717 | 1998 2180 2364 2549 2736 | 2016 2199 2382 2568 2754 | 2035 2217 2401 2586 2773 | 2053 2235 2419 2605 2792 | 2071 2254 2438 2623 2811 | 2089 2272 2456 2642 2830 | 2107 2290 2475 2661 2849 | 3 3 3 3 | 6 6 6 6 | 9 9 9 9 | 12 12 12 12 13 | 15 15 16 16 |
| 2793 2967 3142 3316 3491 | 16 17 18 19 20 | *2867 *3057 *3249 *3443 *3640 | 2886 3076 3269 3463 3659 | 2905 3096 3288 3482 3679 | 2924 3115 3307 3502 3699 | 2943 3134 3327 3522 3719 | 2962 3153 3346 3541 3739 | 2981 3172 3365 3561 3759 | 3000 3191 3385 3581 3779 | 3019 3211 3404 3600 3799 | 3038 3230 3424 3620 3819 | 3 3 3 3 | 6 6 7 7 | 9 10 10 10 10 | 13 13 13 13 13 | 16 16 16 16 |
| 3665 3840 4014 4189 4363 | 21 22 23 24 25 | *3839 *4040 *4245 *4452 *4663 | 3859 4061 4265 4473 4684 | 3879 4081 4286 4494 4706 | 3899 4101 4307 4515 4727 | 3919 4122 4327 4536 4748 | 3939 4142 4348 4557 4770 | 3959 4163 4369 4578 4791 | 3979 4183 4390 4599 4813 | 4000 4204 4411 4621 4834 | 4020 4224 4431 4642 4856 | 3 3 4 4 | 7 7 7 7 | 10 10 10 11 11 | 13 14 14 14 14 | 17 17 17 18 18 |
| 4538 4712 4887 5061 5236 | 26 27 28 29 30 | *4877 *5095 *5317 *5543 *5774 | 4899 5117 5340 5566 5797 | 4921 5139 5362 5589 5820 | 4942 5161 5384 5612 5844 | 4964 5184 5407 5635 5867 | 4986 5206 5430 5658 5890 | 5008 5228 5452 5681 5914 | 5029 5250 5475 5704 5938 | 5051 5272 5498 5727 5961 | 5073 5295 5520 5750 5985 | 4 4 4 4 | 7 7 8 8 8 | 11 11 11 12 12 | 15 15 15 15 16 | 18 18 19 19 20 |
| 5411 5585 5760 5934 6109 | 31 32 33 34 35 | *6009 *6249 *6494 *6745 *7002 | 6032 6273 6519 6771 7028 | 6056 6297 6544 6796 7054 | 6080 6322 6569 6822 7080 | 6104 6346 6594 6847 7107 | 6128 6371 6619 6873 7133 | 6152 6395 6644 6899 7159 | 6176 6420 6669 6924 7186 | 6200 6445 6694 6950 7212 | 6224 6469 6720 6976 7239 | 4 4 4 4 | 8 8 9 9 | 12 12 13 13 13 | 16 16 17 17 18 | 20 20 21 21 22 |
| 6283 6458 6632 6807 6981 | 36 37 38 39 40 | *7265 *7536 *7813 *8098 *8391 | 7292 7563 7841 8127 8421 | 7319 7590 7869 8156 8451 | 7346 7618 7898 8185 8481 | 7373 7646 7926 8214 8511 | 7400 7673 7954 8243 8541 | 7427 7701 7983 8273 8571 | 7454 7729 8012 8302 8601 | 7481 7757 8040 8332 8632 | 7508 7785 8069 8361 8662 | 5 5 5 5 5 | 9 9 9 10 10 | 14 14 14 15 15 | 18 18 19 20 20 | 23 23 24 24 25 |
| 7156 7330 7505 7679 7854 | 41 42 43 44 45 | *8693 *9004 *9325 *9657 1.0000 | 8724 9036 9358 9691 0035 | 8754 9067 9391 9725 0070 | 8785 9099 9424 9759 0105 | 8816 9131 9457 9793 0141 | 8847 9163 9490 9827 0176 | 8878 9195 9523 9861 0212 | 8910 9228 9556 9896 0247 | 8941 9260 9590 9930 0283 | 8972 9293 9623 9965 0319 | 5 6 6 6 | 10 11 11 11 11 12 | 16 16 17 17 18 | 21 21 22 23 24 | 26 27 28 29 30 |

| Radian. | Degree. | 0′ | 6′ | 12' | 18′ | 24' | 30′ | 36′ | 42' | 48' | 54' | M | ean | Diffe | renc | es. |
|--|----------------------------------|--|--|--|--|--|--|--|--|---|---|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|
| Rac | Deg | 0°·0 | 0°·1 | 0°·2 | 03 | 0°.4 | 0°.5 | 0°·6 | 0°.7 | 08 | 0°·9 | 1′ | 2′ | 3′ | 4′ | 5′ |
| *785 *803 *820 *838 *855 *873 | 45 46 47 48 49 50 | 1.0000 1.0355 1.0724 1.1106 1.1504 1.1918 | 0035 0392 0761 1145 1544 1960 | 0070 0428 0799 1184 1585 2002 | 0105 0464 0837 1224 1626 2045 | 0141 0501 0875 1263 1667 2088 | 0176 0538 0913 1303 1708 2131 | 0212 0575 0951 1343 1750 2174 | 0247 0612 0990 1383 1792 2218 | 0283 0649 1028 1423 1833 2261 | 0319 0686 1067 1463 1875 2305 | 6 6 7 7 7 | 12 12 13 13 14 14 | 18 18 19 20 21 22 | 24 25 25 27 28 29 | 30 31 32 33 34 36 |
| *890 *908 *925 *942 *960 | 51 52 53 54 55 | 1.2349 1.2799 1.3270 1.3764 1.4281 | 2393 2846 3319 3814 4335 | 2437 2892 3367 3865 4388 | 2482 2938 3416 3916 4442 | 2527 2985 3465 3968 4496 | 2572 3032 3514 4019 4550 | 2617 3079 3564 4071 4605 | 2662 3127 3613 4124 4659 | 2708 3175 3663 4176 4715 | 2753 3222 3713 4229 4770 | 8 8 9 9 | 15 16 16 17 18 | 23 24 25 26 27 | 30 31 33 34 36 | 38 39 41 43 45 |
| *977 *995 1*012 1*030 1*047 | 56 57 58 59 60 | 1.4826 1.5399 1.6003 1.6643 1.7321 | 4882 5458 6066 6709 7391 | 4938 5517 6128 6775 7461 | 4994 5577 6191 6842 7532 | 5051 5637 6255 6909 7603 | 5108 5697 6319 6977 7675 | 5166 5757 6383 7045 7747 | 5224 5818 6447 7113 7820 | 5282 5880 6512 7182 7893 | 5340 5941 6577 7251 7966 | 10 10 11 11 11 12 | 19 20 21 23 24 | 29 30 32 34 36 | 38 40 43 45 48 | 48 50 53 56 60 |
| 1.065 1.082 1.100 1.117 1.134 | 61 62 63 64 65 | 1.8040 1.8807 1.9626 2.0503 2.1445 | 8115 8887 9711 0594 1543 | 8190 8967 9797 0686 1642 | 8265 9047 9883 0778 1742 | 8341 9128 9970 0872 1842 | 8418 9210 0057 0965 1943 | 8495 9292 0145 1060 2045 | 8572 9375 0233 1155 2148 | 8650 9458 0323 1251 2251 | 8728 9542 0413 1348 2355 | 13 14 15 16 17 | 26 27 29 31 34 | 38 41 44 47 51 | 51 55 58 63 68 | 64 68 73 78 85 |
| 1·152 1·169 1·187 1·204 1·222 | 66 67 68 69 70 | 2·2460 2·3559 2·4751 2·6051 2·7475 | 2566 3673 4876 6187 7625 | 2673 3789 5002 6325 7776 | 2781 3906 5129 6464 7929 | 2889 4023 5257 6605 8083 | 2998 4142 5386 6746 8239 | 3109 4262 5517 6889 8397 | 3220 4383 5649 7034 8556 | 3332 4504 5782 7179 8716 | 3445 4627 5916 7326 8878 | 18 20 22 24 26 | 37 40 43 47 52 | 55 60 65 71 78 | 95 | 92 99 108 119 131 |
| 1·239 1·257 1·274 1·292 1·309 | 71 72 73 74 75 | 2:9042 3:0777 3:2709 3:4874 3:7321 | 9208 0961 2914 5105 7583 | 9375 1146 3122 5339 7848 | 9544 1334 3332 5576 8118 | 9714 1524 3544 5816 8391 | 9887 1716 3759 6059 8667 | 0061 1910 3977 6305 8947 | 0237 2106 4197 6554 9232 | 0415 2305 4420 6806 9520 | 0595 2506 4646 7062 9812 | 29 32 36 41 46 | | 108 122 | | 161 180 204 |
| 1·326 1·344 1·361 1·379 1·396 | 76 77 78 79 80 | 4·0108 4·3315 4·7046 5·1446 5·6713 | 0408 3662 7453 1929 7297 | 0713 4015 7867 2422 7894 | 1022 4374 8288 2924 8502 | 1335 4737 8716 3435 9124 | 1653 5107 9152 3955 9758 | 1976 5483 9594 4486 0405 | 2303 5864 0045 5026 1066 | $\begin{array}{c} 2635 \\ 6252 \\ \hline 0504 \\ 5578 \\ \hline 1742 \end{array}$ | $ \begin{array}{r} 2972 \\ 6646 \\ \hline 0970 \\ 6140 \\ \hline 2432 \end{array} $ | | | | | |
| 1.414 1.431 1.449 1.466 1.484 | 81 82 83 84 85 | 6:3138 7:1154 8:1443 9:514 11:43 | 3859 2066 2636 9.677 11.66 | 4596 3002 3863 9.845 11.91 | | 6122 4947 6427 10·20 12·43 | | 7720 6996 9152 10·58 13·00 | 8548 8062 0579 10:78 13:30 | 9395 9158 2052 10.99 13.62 | 0264 0285 3572 11*20 13*95 | lo | | r sui | ence ficie | |
| 1.501 1.518 1.536 1.553 1.571 | 86 87 88 89 90 | 14:30 19:08 28:64 57:29 ∞ | 19·74 30·14 | 15*06 20*45 31*82 71*62 | 21·20 33·69 | 22.02 35.80 | 22·90 38·19 | 23.86 40.92 | 24.90 44.07 | 26.03 47.74 | 27·27 52·08 | | | | | |

| Radian. | Degree. | 0' | 6' | 12' | 18' | 24' | 30′ | 36′ | 42' | 48' | 54' | Me | an I | Diffe | renc | es. |
|-------------------------|----------|-------------------------|--------------|-------------------------|---------------------|---------------------|-------------------------|-------------------------|-------------------------|---------------------|-------------------------|----------|----------|----------|------------|------------|
| Rac | Deg | 0°0 | 0°·1 | 0°·2 | 0°.3 | 0°·4 | 0°.5 | 0°.6 | 0°.7 | 0°.8 | 0°.9 | 1′ | 2′ | 3′ | 4′ | 5′ |
| .0000 | 0 | | | 286.5 | | | 114.6 | | | 71.62 | | | | | | |
| 0475 | 2 | 57.29 28.64 19.08 | 27.27 | 47.74 26.03 17.89 | 24.90 | 23.86 | 38·19 22·90 16·35 | 35.80 22.02 15.89 | 33.69 21.20 15.46 | 20.45 | 30·14 19·74 14·67 | | | | | |
| °0524 °0694 °0873 | 3 4 5 | 14·30 11·43 | 13.95 | 13.62 10.99 | 13.30 | 13.00 | 12.71 | 12·43 10·20 | 12.16 | 11.91 | 11.66 9.677 | | | | | |
| 1047 | 6 | 9.5144 | 3572 | 2052 | 0579 | 9152 | 7769 | 6427 | 5126 | 3863 | 2636 | | | | | |
| -1222 | 7 | 8.1443 | 0285 | 9158 | 8062 | 6996 | 5958 | 4947 | 3962 | 3002 | 2066 | | | | | not rate. |
| *1396 *1571 | 8 9 | 7·1154 6·3138 | 0264 2432 | 9395 1742 | 8548 1066 | 7720 0405 | $\frac{6912}{9758}$ | $\frac{6122}{9124}$ | 5350 8502 | 4596 7894 | 3859 7297 | | | | | |
| 1745 | 10 | 5.6713 | 6140 | 5578 | 5026 | 4486 | 3955 | 3435 | 2924 | 2422 | 1929 | | | | | |
| *1920 *2094 | 11 12 | 5·1446 4·7046 | 0970 6646 | 0504 6252 | 0045 5864 | 9594 5483 | 9152 5107 | 8716 4737 | 8288 4374 | .7867 4015 | 7453 3662 | | | | | |
| *2269 | 13 | 4.3315 | 2972 9812 | 2635 9520 | $\frac{2303}{9232}$ | $\frac{1976}{8947}$ | 1653 | 1335 | 1022 | 0713 | 0408 | | | | | |
| ·2443 ·2618 | 14 15 | 4·0108 3·7321 | 7062 | 6806 | 6554 | 6305 | 8667 6059 | 8391 5816 | 8118 5576 | 7848 5339 | 7583 5105 | | | | | |
| 2793 | 16 | 3.4874 | 4646 | 4420 | 4197 2106 | 3977 | 3759 | 3544 | 3332 | 3122 | 2914 | 36 | | | 144 | |
| ·2967 ·3142 | 17 | 3·2709 3·0777 | 2506 0595 | 2305 0415 | 0237 | 1910 0061 | $\frac{1716}{9887}$ | $\frac{1524}{9714}$ | 1334 9544 | $\frac{1146}{9375}$ | 0961 9208 | 32 29 | 64 58 | 96 87 | 129 116 | |
| ·3316 ·3491 | 19 20 | 2·9042 2·7475 | 8878 7326 | 8716 7179 | 8556 7034 | 8397 6889 | 8239 6746 | 8083 6605 | 7929 6464 | 7776 6325 | 7625 6187 | 26 24 | 52 57 | 78 71 | | 131 119 |
| *3665 | 21 | 2.6051 | 5916 | 5782 | 5649 | 5517 | 5386 | 5257 | 5129 | 5002 | 4876 | 22 | 43 | 65 | 87 | 108 |
| ·3840 ·4014 | 22 23 | 2·4751 2·3559 | 4627 3445 | 4504 3332 | 4383 3220 | 4262 3109 | 4142 2998 | 4023 2889 | 3906 2781 | 3789 2673 | 3673 2566 | 20 18 | 40 37 | 60 55 | 79 73 | 99 92 |
| ·4189 ·4363 | 24 25 | 2·2460 2·1445 | 2355 1348 | 2251 1251 | 2148 1155 | 2045 1060 | 1943 0965 | 1842 0872 | 1742 0778 | 1642 0686 | 1543 0594 | 17 16 | 34 31 | 51 47 | 68 63 | 85 78 |
| *4538 | 26 | 2.0503 | 0413 | 0323 | 0233 | 0145 | 0057 | 9970 | 9883 | 9797 | 9711 | 15 | 29 | 44 | 58 | 73 |
| ·4712 ·4887 | 27 28 | 1.9626 1.8807 | 9542 8728 | 9458 8650 | 9375 8572 | 9292 8495 | 9210 8418 | 9128 8341 | 9047 8265 | 8967 8190 | 8887 8115 | 14 13 | 27 26 | 41 38 | 55 51 | 68 64 |
| *5061 *5236 | 29 30 | 1.8040 1.7321 | 7966 7251 | 7893 7182 | 7820 7113 | 7747 7045 | 7675 6977 | 7603 6909 | 7532 6842 | 7461 6775 | 7391 6709 | 12 11 | 24 23 | 36 34 | 48 45 | 60 56 |
| •5411 | 31 | 1.6643 | 6577 | 6512 | 6447 | 6383 | 6319 | 6255 | 6191 | 6128 | 6066 | 11 | 21 | 32 | 43 | 53 |
| ·5585 ·5760 | 32 | 1.6003 | 5941 5340 | 5880 5282 | 5818 5224 | 5757 5166 | 5697 5108 | 5637 5051 | 5577 4994 | 5517 4938 | 5458 4882 | 10 | 20 19 | 30 29 | 40 38 | 50 48 |
| •5934 •6109 | 34 | 1·4826 1·4281 | 4770 4229 | 4715 4176 | 4659 4124 | 4605 | 4550 4019 | 4496 3968 | 4442 3916 | 4388 3865 | 4335 3814 | 9 | 18 17 | 27 | 36 34 | 45 43 |
| .6283 | 36 | 1.3764 | 3713 | 3663 | 3613 | 3564 | 3514 | 3465 | 3416 | 3367 | 3319 | 8 | 16 | 25 | 33 | 41 |
| *6458 | 37 | 1.3270 | 3222 | 3175 | 3127 2662 | 3079 | 3032 | 2985 | 2938 | 2892 | 2846 | 8 | 16 | 24 | 31 | 39 |
| ·6632 ·6807 | 38 | 1.2799 | 2753 | 2708 2261 | 2218 | 2617 | 2572 2131 | 2527 2088 | 2482 2045 | 2437 2002 | 2393 1960 | 8 7 | 15 14 | 23 22 | 30 29 | 38 36 |
| .6981 | 40 | 1.1918 | 1875 | 1833 | 1792 | 1750 | 1708 | 1667 | 1626 | 1585 | 1544 | 7 | 14 | 21 | 18 | 34 |
| ·7156 ·7330 | 41 42 | 1.1504 | 1463 1067 | 1423 1028 | 1383 0990 | 1343 0951 | 1303 0913 | 1263 0875 | 1224 0837 | 1184 0799 | 1145 0761 | 7 6 | 13 13 | 20 19 | 27 25 | 33 32 |
| ·7505 ·7679 | 43 | 1.0724 1.0355 | 0686 | 0649 0283 | 0612 0247 | 0575 0212 | 0538 0176 | 0501 0141 | 0464 0105 | 0428 0070 | 0392 0035 | 6 | 12 12 | 18 18 | 25 24 | 31 30 |
| •7854 | 45 | 1.0000 | 9965 | 9930 | 9896 | 9861 | 9827 | 9793 | 9759 | 9725 | 9691 | 6 | 11 | 17 | 23 | 29 |
| | 1 | Radian= | = 0017 | 0035 | 0052 | 0070 | 0087 | 0105 | 0122 | 9140 | 0157 | | | | | |

| an. | ee. | 0′ | 6′ | 12' | 18' | 24' | 30′ | 36′ | 42' | 48' | 54' | Me | an 1 | Diffe | renc | es. |
|--|----------------------------------|--|--|--|--|--|--|--|--|--|--|-----------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|
| Radian. | Degree. | 0°·0 | 0°·1 | 0°·2 | 0°·3 | 0°·4 | 0°·5 | 0°·6 | 0°•7 | 0°•8 | 0°·9 | 1' | 2′ | 3′ | 4' | 5' |
| *785 *803 *820 *838 *855 *873 | 45 46 47 48 49 50 | 1·0000 0·9657 ·9325 ·9004 ·8693 ·8391 | 9965 9623 9293 8972 8662 8361 | 9930 9590 9260 8941 8632 8332 | 9896 9556 9228 8910 8601 8302 | 9861 9523 9195 8878 8571 8273 | 9827 9490 9163 8847 8541 8243 | 9793 9457 9131 8816 8511 8214 | 9759 9424 9099 8785 8481 8185 | 9725 9391 9067 8754 8451 8156 | 9691 9358 9036 8724 8421 8127 | 6 5 5 5 5 | 11 11 11 10 10 10 | 17 17 16 16 15 15 | 23 22 21 21 20 20 | 29 28 27 26 25 24 |
| *890 *908 *925 *942 *960 | 51 52 53 54 55 | *8098 *7813 *7536 *7265 *7002 | 8069 7785 7508 7239 6976 | 8040 7757 7481 7212 6950 | 8012 7729 7454 7186 6924 | 7983 7701 7427 7159 6899 | 7954 7673 7400 7133 6873 | 7926 7646 7373 7107 6847 | 7898 7618 7346 7080 6822 | 7869 7590 7319 7054 6796 | 7841 7563 7292 7028 6771 | 5 5 4 4 | 9 9 9 | 14 14 14 13 13 | 19 18 18 18 17 | 24 23 23 22 21 |
| ·977 ·995 1·012 1·030 1·047 | 56 57 58 59 60 | ·6745 ·6494 ·6249 ·6009 ·5774 | 6720 6469 6224 5985 5750 | 6694 6445 6200 5961 5727 | 6669 6420 6176 5938 5704 | 6644 6395 6152 5914 5681 | 6619 6371 6128 5890 5658 | 6594 6346 6104 5867 5635 | 6569 6322 6080 5844 5612 | 6544 6297 6056 5820 5589 | 6519 6273 6032 5797 5566 | 4 4 4 4 | 8 8 8 8 | 13 12 12 12 12 12 | 17 16 16 16 16 | 21 20 20 20 19 |
| 1.065 1.082 1.100 1.117 1.134 | 61 62 63 64 65 | *5543 *5317 *5095 *4877 *4663 | 5520 5295 5073 4856 4642 | 5498 5272 5051 4834 4621 | 5475 5250 5029 4813 4599 | 5452 5228 5008 4791 4578 | 5430 5206 4986 4770 4557 | 5407 5184 4964 4748 4536 | 5384 5161 4942 4727 4515 | 5362 5139 4921 4706 4494 | 5340 5117 4899 4684 4473 | 4 4 4 | 8 7 7 7 | 1I 11 11 11 11 | 15 15 15 14 14 | 19 18 19 18 |
| 1·152 1·169 1·187 1·204 1·222 | 66 67 68 69 70 | *4452 *4245 *4040 *3839 *3640 | 4431 4224 4020 3819 3620 | 4411 4204 4000 3799 3600 | 4390 4183 3979 3779 3581 | 4369 4163 3959 3759 3561 | 4348 4142 3939 3739 3541 | 4327 4122 3919 3719 3522 | 4307 4101 3899 3699 3502 | 4286 4081 3879 3679 3482 | 4265 4061 3859 3659 3463 | 3 3 3 3 | 7 7 7 7 | 10 10 10 10 10 | 14 14 13 13 | 17 17 17 17 16 |
| 1·239 1·257 1·274 1·292 1·309 | 71 72 73 74 75 | *3443 *3249 *3057 *2867 *2679 | 3424 3230 3038 2849 2661 | 3404 3211 3019 2830 2642 | 3385 3191 3000 2811 2623 | 3365 3172 2981 2792 2605 | 3346 3153 2962 2773 2586 | 3327 3134 2943 2754 2568 | 3307 3115 2924 2736 2549 | 3288 3096 2905 2717 2530 | 3269 3076 2886 2698 2512 | 3 3 3 3 | 6 6 6 | 10 10 9 9 | 13 13 13 13 12 | 16 16 16 16 |
| 1·326 1·344 1·361 1·379 1·396 | 76 77 78 79 80 | *2493 *2309 *2126 *1944 *1763 | 2475 2290 2107 1926 1745 | 2456 2272 2089 1908 1727 | 2438 2254 2071 1890 1709 | 2419 2235 2053 1871 1691 | 2401 2217 2035 1853 1673 | 2382 2199 2016 1835 1655 | 2364 2180 1998 1817 1638 | 2345 2162 1980 1799 1620 | 2327 2144 1962 1781 1602 | 3 3 3 | 6 6 6 6 | 9 9 | 12 12 12 12 12 | 18 18 18 18 |
| 1.414 1.431 1.449 1.466 1.484 | 81 82 83 84 85 | 1584 1405 1228 1051 0875 | 1566 1388 1210 1033 0857 | 1548 1370 1192 1016 0840 | 1530 1352 1175 0998 0822 | 1512 1334 1157 0981 0805 | 1495 1317 1139 0963 0787 | 1477 1299 1122 0945 0769 | 1459 1281 1104 0928 0752 | 1441 1263 1086 0910 0734 | 1423 1246 1069 0892 0717 | 3 3 3 3 | 6 6 6 6 | 9 9 9 9 | 12 12 12 12 12 | 15 15 15 15 15 |
| . 501 . 518 . 536 . 553 . 571 | 86 87 88 89 90 | *0699 *0524 *0349 *0175 0 | 0682 0507 0332 0157 | 0664 0489 0314 0140 | 0647 0472 0297 0122 | 0629 0454 0279 0105 | 0612 0437 0262 0087 | 0594 0419 0244 0070 | 0577 0402 0227 0052 | 0559 0384 0209 0035 | 0542 0367 0192 0017 | 3 3 3 | 6 6 6 | 9 9 | 12 12 12 12 | 15 15 15 15 |

| Radian. | ree. | ó′ | 6' | 12' | 18' | 24' | 30′ | 36′ | 42' | 48' | 54' | Me | an l | Diffe | renc | es. |
|--|----------------------------|--|--|--|--|--|--|--|--|--|--|----------------------------|-----------------------|----------------------------|----------------------------|----------------------------|
| Rad | Degree. | 0°·0 | 0°·1 | 0°·2 | 03 | 0°·4 | 0°.5 | 0°·6 | 0°·7 | 0°.8 | 0°·9 | 1' | 2′ | 3′ | 4′ | 5' |
| 0000 0175 0349 0524 0698 0873 | 0 1 2 3 4 5 | 1.0000 0002 0006 0014 0024 0038 | 0000 0002 0007 0015 0026 0040 | 0000 0002 0007 0016 0027 0041 | 0000 0003 0008 0017 0028 0043 | 0000 0003 0009 0018 0030 0045 | 0000 0003 0010 0019 0031 0046 | 0001 0004 0010 0020 0032 0048 | 0001 0004 0011 0021 0034 0050 | 0001 0005 0012 0022 0035 0051 | 0001 0006 0013 0023 0037 0053 | 0 0 0 0 0 | 0 0 0 0 0 | 0 0 0 1 1 1 | 0 0 1 1 1 1 | 0 0 1 1 1 1 |
| .047 .222 .396 .571 .745 | 6 7 8 9 10 | 0055 0075 0098 0125 0154 | 0057 0077 0101 0127 0157 | 0059 0079 0103 0130 0161 | 0061 0082 0106 0133 0164 | 0063 0084 0108 0136 0167 | 0065 0086 0111 0139 0170 | 0067 0089 0114 0142 0174 | 0069 0091 0116 0145 0177 | 0071 0093 0119 0148 0180 | 0073 0096 0122 0151 0184 | 0 0 0 0 1 | 1 1 1 1 | 1 1 1 1 2 | 1 2 2 2 2 | 24 54 54 64 64 |
| 1920 2094 2269 2443 2618 | 11 12 13 14 15 | 0187 0223 0263 0306 0353 | 0191 0227 0267 0311 0358 | 0194 0231 0271 0315 0363 | 0198 0235 0276 0320 0367 | 0201 0239 0280 0324 0372 | 0205 0243 0284 0329 0377 | 0209 0247 0288 0334 0382 | 0212 0251 0293 0338 0388 | 0216 0255 0297 0343 0393 | 0220 0259 0302 0348 0398 | 1 1 1 1 | 1 1 1 2 2 | 2 2 2 2 3 | 2 3 3 3 3 | 4 4 |
| 2793 2967 3142 3316 3491 | 16 17 18 19 20 | 0403 0457 0515 0576 0642 | 0408 0463 0521 0583 0649 | 0413 0468 0527 0589 0655 | 0419 0474 0533 0595 0662 | 0424 0480 0539 0602 0669 | 0429 0485 0545 0608 0676 | 0435 0491 0551 0615 0683 | 0440 0497 0557 0622 0690 | 0446 0503 0564 0628 0697 | 0451 0509 0570 0635 0704 | 1 1 1 1 1 | 2 2 2 2 2 | 3 3 3 4 | 4 4 4 5 | 4 |
| 3665 3840 4014 4189 4363 | 21 22 23 24 25 | 0711 0785 0864 0946 1034 | 0719 0793 0872 0955 1043 | 0726 0801 0850 0963 1052 | 0733 0808 0888 0972 1061 | 0740 0816 0896 0981 1070 | 0748 0824 0904 0989 1079 | 0755 0832 0913 0998 1089 | 0763 0840 0921 1007 1098 | 0770 0848 0929 1016 1107 | 0778 0856 0938 1025 1117 | 1 1 1 1 2 | 2 3 3 3 3 | 4 4 4 5 | 5 5 6 6 | 0.000 |
| 1538 1712 1887 5061 5236 | 26 27 28 29 30 | 1126 1223 1326 1434 1547 | 1136 1233 1336 1445 1559 | 1145 1243 1347 1456 1570 | 1155 1253 1357 1467 1582 | 1164 1264 1368 1478 1594 | 1174 1274 1379 1490 1606 | 1184 1284 1390 1501 1618 | 1194 1294 1401 1512 1630 | 1203 1305 1412 1524 1642 | 1213 1315 1423 1535 1654 | 2 2 2 2 2 2 | 3 4 4 4 | 5 5 6 6 | 6 7 7 7 8 | 10 |
| 5411 5585 5760 5934 8109 | 31 32 33 34 35 | 1666 1792 1924 2062 2208 | 1679 1805 1937 2076 2223 | 1691 1818 1951 2091 2238 | 1703 1831 1964 2105 2253 | 1716 1844 1978 2120 2268 | 1728 1857 1992 2134 2283 | 1741 1870 2006 2149 2299 | 1753 1883 2020 2163 2314 | 1766 1897 2034 2178 2329 | 1779 1910 2048 2193 2345 | 2 2 2 2 3 | 4 4 5 5 5 | 6 7 7 7 8 | 8 9 9 10 10 | 10 11 15 15 18 |
| 3283 3458 3632 3807 3981 | 36 37 38 39 40 | 2361 2521 2690 2868 3054 | 2376 2538 2708 2886 3073 | 2392 2554 2725 2904 3093 | 2408 2571 2742 2923 3112 | 2424 2588 2760 2941 3131 | 2440 2605 2778 2960 3151 | 2456 2622 2796 2978 3171 | 2472 2639 2813 2997 3190 | 2489 2656 2831 3016 3210 | 2505 2673 2849 3035 3230 | 3 3 3 3 | 5 6 6 6 7 | 8 9 9 10 10 | 11 12 12 13 13 | 13 14 15 15 16 |
| 7156 7330 7505 7679 7854 | 41 42 43 44 45 | 3250 3456 3673 3902 4142 | 3270 3478 3696 3925 4167 | 3291 3499 3718 3949 4192 | 3311 3520 3741 3972 4217 | 3331 3542 3763 3996 4242 | 3352 3563 3786 4020 4267 | 3373 3585 3809 4044 4293 | 3393 3607 3832 4069 4318 | 3414 3629 3855 4093 4344 | 3435 3651 3878 4118 4370 | 4 4 4 4 | 7 7 8 8 8 | 10 11 11 12 13 | 14 14 15 16 17 | 17 18 19 20 21 |

| Radian. | Degree. | O' | 6′ | 12' | 18' | 24' | 30′ | 36′ | 42' | 48' | 54' | Ме | an I | Diffe | renc | ees. |
|--|----------------------------------|--|--|--|--|--|---|---|--|--|--|----------------------------|--------------------------------|----------------------------------|----------------------------------|----------------------------------|
| Rad | Deg | 00 | 0°·1 | 0°·2 | 0°·3 | 0°.4 | 0°·5 | 0°·6 | 0°.7 | 0°.8 | 0°.9 | 1′ | 2′ | 3′ | 4' | 5' |
| *785 *803 *820 *838 *855 *873 | 45 46 47 48 49 50 | 1·4142 4396 4663 4945 5243 5557 | 4167 4422 4690 4974 5273 5590 | 4192 4448 4718 5003 5304 5622 | 4217 4474 4746 5032 5335 5655 | 4242 4501 4774 5062 5366 5688 | 4267 4527 4802 5092 5398 .5721 | 4293 4554 4830 5121 5429 5755 | 4318 4581 4859 5151 5461 5788 | 4344 4608 4887 5182 5493 5822 | 4370 4635 4916 5212 5525 5856 | 4 4 5 5 5 6 | 8 9 10 10 10 11 | 13 13 14 15 16 17 | 17 18 19 20 21 22 | 21 22 23 25 26 28 |
| *890 *908 *925 *942 *960 | 51 52 53 54 55 | 5890 6243 6616 7013 7434 | 5925 6279 6655 7054 7478 | 5959 6316 6694 7095 7522 | 5994 ° 6353 6733 7137 7566 | 6029 6390 6772 7179 7610 | 6064 6427 6812 7221 7655 | 6099 6464 6852 7263 7700 | 6135 6502 6892 7305 7745 | 6171 6540 6932 7348 7791 | 6207 6578 6972 7391 7837 | 6 6 7 7 7 | 12 12 13 14 15 | 18 19 20 21 22 | 24 25 26 28 30 | 30 31 33 35 37 |
| ·977 ·995 1·012 1·030 1·047 | 56 57 58 59 60 | 7883 8361 8871 9416 2.0000 | 7929 8410 8924 9473 0061 | 7976 8460 8977 9530 0122 | 8023 8510 9031 9587 0183 | 8070 8561 9084 9645 0245 | 8118 8612 9139 9703 0308 | 8166 8663 9194 9762 0371 | 8214 8714 9249 9821 0434 | 8263 8766 9304 9880 0498 | 8312 8818 9360 9940 0562 | 8 8 9 10 10 | 16 17 18 19 21 | 24 26 27 29 31 | 32 34 36 39 42 | 40 43 46 49 52 |
| 1.065 1.082 1.100 1.117 1.134 | 61 62 63 64 65 | 0627 1301 2027 2812 3662 | 0692 1371 2103 2894 3751 | 0757 1441 2179 2976 3841 | 0824 1513 2256 3060 3931 | 0890 1584 2333 3144 4022 | 0957 1657 2412 3228 4114 | 1025 1730 2490 3314 4207 | 1093 1803 2570 3400 4300 | 1162 1877 2650 3486 4395 | 1231 1952 2730 3574 4490 | 11 12 13 14 15 | 22 24 26 28 31 | 33 37 39 43 46 | 45 48 52 57 62 | 56 61 66 71 77 |
| 1·152 1·169 1·187 1·204 1·222 | 66 67 68 69 70 | 4586 5593 6695 7904 9238 | 4683 5699 6811 8032 9379 | 4780 5805 6927 8161 9521 | 4879 5913 7046 8291 9665 | 4978 6022 7165 8422 9811 | 5078 6131 7285 8555 9957 | 5180 6242 7407 8688 0106 | 5282 6354 7529 8824 0256 | 5384 6466 7653 8960 0407 | 5488 6580 7778 9099 0561 | 17 18 20 22 25 | 34 37 40 44 49 | 50 55 61 67 74 | 89 | 84 91 101 111 123 |
| 1·239 1·257 1·274 1·292 1·309 | 71 72 73 74 75 | 3·0716 2361 4203 6280 8637 | 0872 2535 4399 6502 8890 | 1030 2712 4598 6727 9147 | 1190 2891 4799 6955 9408 | 1352 3072 5003 7186 9672 | 1515 3255 5209 7420 9939 | 1681 3440 5418 7657 0211 | 1848 3628 5629 7897 0486 | 2017 3817 5843 8140 0765 | 2188 4009 6060 8387 1048 | 27 31 35 39 45 | 78 | 92 104 118 | 138 | 153 173 196 |
| 1:326 1:344 1:361 1:379 1:396 | 76 77 78 79 80 | 4·1336 4454 8097 5·2408 7588 | 1627 4793 8496 2883 8164 | 1923 5137 8901 3367 8751 | 2223 5486 9313 3860 9351 | 2527 5841 9732 4362 9963 | 2837 6202 0159 4874 0589 | $ \begin{array}{r} 3150 \\ 6569 \\ \hline 0593 \\ 5396 \\ \hline 1227 \end{array} $ | 3469 6942 1034 5928 1880 | 3792 7321 1484 6470 2546 | 4121 7706 1942 7023 3228 | | | | | |
| 1:414 1:431 1:449 1:466 1:484 | 81 82 83 84 85 | 6·8925 7·1853 8·2055 9·5668 11·47 | | 5366 3684 4457 9*895 11*95 | | | 7655 6613 8337 10:43 12:75 | | 9273 8700 1129 10.83 13.34 | 0112 9787 2593 11.03 13.65 | 0972 0905 4105 11:25 13:99 | 10 | | r sui | ence ficie | |
| 1.501 1.518 1.536 1.553 1.571 | 86 87 88 89 90 | 14·34 19·11 28·65 57·30 ∞ | 19.77 30.16 | 20·47 31·84 | 21·23 33·71 | 22.04 35.81 | 22.93 38.20 | 23.88 40.93 | 17·37 24·92 44·08 191·0 | 26.05 47.75 | 27·29 52·09 | | | | | |

Radian=0017 0035 0052 0070 0087 0105 0122 0140 0157

| | 'n. | 6 | | | | | | | , | | | | Me | an | Diffe | renc | es |
|----|--------------|----------|------------------|----------------|--------------|--------------|--------------|--------------|--------------|----------------|--------------|----------------|----------|----------|----------|----------|------------|
| | Radian, | Degree. | 0' | 6′ | 12′ | 18′ | 24' | 30′ | 36′ | 42' | 48' | 54' | | | | | |
| | Ra | De | 0°•0 | 0°·1 | 0°·2 | 0°·3 | 0°·4 | 0°·5 | 0°.6 | 0°.7 | 08 | 0°·9 | 1' | 2′ | 3′ | 4' | 5′ |
| | 0000 0175 | 0 | 57:30 | 573.0 | 286.5 | 191.0 | 143.2 | 114.6 | 95.49 | 81.85 | 71.62 | | | | | | |
| • | 0349 | 2 | 28.65 | 27.29 | 26.05 | 24.92 | 23.88 | 22.93 | 22.04 | 33.71 21.23 | 20.47 | 30·16 19·77 | | | | | |
| | 0524 0698 | 3 4 | 19.11 | 18:49 | 17.91 | 17.37 | 16.86 | 16.38 | 15.93 | 15.50 | 15.09 | 14.70 | | | | | |
| | 0873 | 5 | 14·34 11·47 | 13.99 11.25 | 11.03 | 10.83 | 10.63 | 10.43 | 10.25 | 10.07 | 9.895 | 9.728 | | | | | |
| | 1047 | 6 | 9.5668 | 4105 | 2593 | 1129 | 9711 | 8337 | 7004 | 5711 | 4457 | 3238 | 1/00 | 2: | or | | |
| | 1222 1396 | 8 | 8·2055 7·1853 | 0905 0972 | 9787 0112 | 8700 9273 | 7642 8454 | 6613 7655 | 5611 6874 | 4635 | 3684 5366 | 2757 4637 | suffi | | | | not |
| | 1571 | 9 | 6.3925 | 3228 | 2546 | 1880 | 1227 | 0589 | 9963 | 6111 9351 | 8751 | 8164 | | | | | |
| | 1754 | 10 | 5.7588 | 7023 | 6470 | 5928 | 5396 | 4847 | 4362 | 3860 | 3367 | 2883 | | | | | |
| | 1920 2094 | 11 12 | 2408 4.8097 | 1942 7706 | 1484 7321 | 1034 6942 | 0593 6569 | 0159 6202 | 9732 5841 | 9313 5486 | 8901 5137 | 8496 4793 | | | | | |
| | 2269 | 13 | 4454 | 4121 | 3792 | 3469 | 3150 | 2837 | 2527 | 2223 | 1923 | 1627 | | | | | |
| | 2443 | 14 | 1336 | 1048 | 0765 | 0486 | 0211 | 9939 | 9672 | 9408 | 9147 | 8890 | | | | | |
| • | 2618 | 15 | 3.8637 | 8387 | 8140 | 7897 | 7657 | 7420 | 7186 | 6955 | 6727 | 6502 | | - | | | - |
| | 2793 | 16 | 6280 | 6060 | 5843 | 5629 | 5418 | 5209 | 5003 | 4799 | 4598 | 4399 | 35 | | | 138 | |
| | 2967 3142 | 17 18 | 4203 2361 | 4009 2188 | 3817 2017 | 3628 1848 | 3440 1681 | 3255 1515 | 3072 1352 | 2891 1190 | 2712 1030 | 2535 0872 | 31 27 | 61 55 | | | 153 137 |
| | 3316 | 19 | 0716 | 0561 | 0407 | 0256 | 0106 | 9957 | 9811 | 9665 | 9521 | 9379 | 25 | 49 | 74 | | 123 |
| •: | 3491 | 20 | 2.9238 | 9099 | 8960 | 8824 | 8688 | 8555 | 8422 | 8291 | 8161 | 8032 | 22 | 44 | 67 | 89 | 111 |
| | 3665 3840 | 21 22 | 7904 6695 | 7778 6580 | 7653 6466 | 7529 6354 | 7407 6242 | 7285 6131 | 7165 6022 | 7046 5913 | 6927 5805 | 6811 5699 | 20 18 | 40 37 | 61 55 | 81 74 | 101 91 |
| • | 4014 | 23 | 5593 | 5488 | 5384 | 5282 | 5180 | 5078 | 4978 | 4879 | 4780 | 4683 | 17 | 34 | 50 | 68 | 84 |
| | 4189 4363 | 24 25 | 4586 3662 | 4490 3574 | 4395 3486 | 4300 3400 | 4207 3314 | 4114 3228 | 4022 3144 | 3931 3060 | 3841 2976 | 3751 2894 | 15 14 | 31 28 | 46 | 62 57 | 77 71 |
| | | | | | | | | | | | | | | | | | |
| | 4538 4712 | 26 27 | 2812 2027 | 2730 1952 | 2650 1877 | 2570 1803 | 2490 1730 | 2412 1657 | 2333 1584 | 2256 1513 | 2179 1441 | 2103 | 13 12 | 26 24 | 39 | 52 48 | 66 61 |
| • | 4887 | 28 | 1301 | 1231 | 1162 | 1093 | 1025 | 0957 | 0890 | 0824 | 0757 | 0692 | 11 | 22 | 33 | 45 | 56 |
| | 5061 | 29 | 0627 | 0562 | 0498 | 0434 | 0371 | 0308 | 0245 | 0183 | 0122 | 0061 | 10 | 21 | 31 | 42 | 52 |
| • | 5236 | 30 | 2.0000 | 9940 | 9880 | 9821 | 9762 | 9703 | 9645 | 9587 | 9530 | 9473 | 10 | 19 | 29 | 39 | 49 |
| | 5411 | 31 | 1.9416 | 9360 | 9304 | 9249 | 9194 | 9139 | 9084 | 9031 | 8977 | 8924 | 9 | 18 17 | 27 26 | 36 34 | 46 43 |
| | 5535 5760 | 32 33 | 8871 8361 | 8818 8312 | 8766 8263 | 8714 8214 | 8663 8166 | 8612 8118 | 8561 8070 | 8510 8023 | 8460 7976 | 8410 7929 | 8 | 16 | 20 | 32 | 40 |
| ٠ | 5934 | 34 | 7883 | 7837 | 7791 | 7745 | 7700 | 7655 | 7610 | 7566 | 7522 | 7478 | 7 | 15 | 22 | 30 | 37 |
| .(| 6109 | 35 | 7434 | 7391 | 7348 | 7305 | 7263 | 7221 | 7179 | 7137 | 7095 | 7054 | 7 | 14 | 21 | 28 | 35 |
| | 6283 6458 | 36 37 | 7013 6616 | 6972 6578 | 6932 6540 | 6892 6502 | 6852 6464 | 6812 6427 | 6772 6390 | 6733 6353 | 6694 6316 | 6655 6279 | 7 | 13 12 | 20 19 | 26 25 | 33 31 |
| | 0408 | 38 | 6243 | 6207 | 6171 | 6135 | 6099 | 6064 | 6029 | 5994 | 5959 | 5925 | 6 | .12 | 18 | 24 | 30 |
| *(| 6807 | 39 | 5890 | 5856 | 5822 | 5788 | 5755 | 5721 | 5688 | 5655 | 5622 | 5590 | 6 | 11 10 | 17 | 22 21 | 28 26 |
| | 6981 | 40 | 5557 | 5525 | 5493 | 5461 | 5429 | 5398 | 5366 | 5335 | 5304 | 5273 | 5 | | 16 | | |
| | 7156 7330 | 41 42 | 5243 4945 | 5212 4916 | 5182 4887 | 5151 4859 | 5121 4830 | 5092 4802 | 5062 4774 | 5032 4746 | 5003 4718 | 4974 4690 | 5 | 10 10 | 15 14 | 20 19 | 25 23 |
| • | 7505 | 43 | 4663 | 4635 | 4608 | 4581 | 4554 | 4527 | 4501 | 4474 | 4448 | 4422 | 4 | 9 | 13 | 18 | 22 |
| | 7679 7854 | 44 45 | 4396 4142 | 4370 4118 | 4344 4093 | 4318 4069 | 4293 4044 | 4267 4020 | 4242 3996 | 4217 3972 | 4192 3949 | 4167 3925 | 4 | 8 | 13 12 | 17 16 | 21 20 |
| | 1004 | 40 | 4142 | 4110 | *093 | 4009 | 4044 | 4020 | 0990 | 3912 | 3048 | 0040 | * | 0 | 14 | 10 | 20 |
| | | F | Radian= | 0017 | 0035 | 0052 | 0070 | 0087 | 0105 | 0122 | 0140 | 0157 | | | | | |

| an. | ee. | 0, | 6′ | 12' | 18′ | 24' | 30′ | 36′ | 42' | 48' | 54' | Me | an] | Diffe | renc | es. |
|--|----------------------------------|--|--|--|--|--|--|--|--|--|--|----------------------------|----------------------------|----------------------------|----------------------------------|----------------------------------|
| Radian. | Degree. | 0°·0 | 0°·1 | 0°·2 | 03 | 0°·4 | 0°.5 | 0°.6 | 0°·7 | 0°.8 | 09 | 1' | 2' | 3′ | 4' | 5' |
| *785 *803 *820 *838 *855 *873 | 45 46 47 48 49 50 | 1·4142 3902 3673 3456 3250 3054 | 4118 3878 3651 3435 3230 3035 | 4093 3855 3629 3414 3210 3016 | 4069 3832 3607 3393 3190 2997 | 4044 3809 3585 3373 3171 2978 | 4020 3786 3563 3352 3151 2960 | 3996 3763 3542 3331 3131 2941 | 3972 3741 3520 3311 3112 2923 | 3949 3718 3499 3291 3093 2904 | 3925 3696 3478 3270 3073 2886 | 4 4 4 3 3 | 8 8 7 7 7 6 | 12 11 11 10 10 | 16 15 14 14 13 13 | 20 19 18 17 16 15 |
| *890 *908 *925 *942 *960 | 51 52 53 54 55 | 2868 2690 2521 2361 2208 | 2849 2673 2505 2345 2193 | 2831 2656 2489 2329 2178 | 2813 2639 2472 2314 2163 | 2796 2622 2456 2299 2149 | 2778 2605 2440 2283 2134 | 2760 2588 2424 2268 2120 | 2742 2571 2408 2253 2105 | 2725 2554 2392 2238 2091 | 2708 2538 2376 2223 2076 | 3 3 3 2 | 6 5 5 5 | 9 9 8 8 7 | 12 12 11 10 10 | 15 14 13 13 12 |
| 977 995 1 012 1 030 1 047 | 56 57 58 59 60 | 2062 1924 1792 1666 1547 | 2048 1910 1779 1654 1535 | 2034 1897 1766 1642 1524 | 2020 1883 1753 1630 1512 | 2006 1870 1741 1618 1501 | 1992 1857 1728 1606 1490 | 1978 1844 1716 1594 1478 | 1964 1831 1703 1582 1467 | 1951 1818 1691 1570 1456 | 1937 1805 1679 1559 1445 | 2 2 2 2 2 2 | 5 4 4 4 4 | 7 7 6 6 6 | 9 9 8 8 7 | 12 11 10 10 9 |
| 1.065 1.082 1.100 1.117 1.134 | 61 62 63 64 65 | 1434 1326 1223 1126 1034 | 1423 1315 1213 1117 1025 | 1412 1305 1203 1107 1016 | 1401 1294 1194 1098 1007 | 1390 1284 1184 1089 0998 | 1379 1274 1174 1079 0989 | 1368 1264 1164 1070 0981 | 1357 1253 1155 1061 0972 | 1347 1243 1145 1052 0963 | 1336 1233 1136 1043 0955 | 2 2 2 2 2 1 | 3 3 3 | 5 5 5 4 | 7 7 6 6 6 | 9 9 8 8 7 |
| 1·152 1·169 1·187 1·204 1·222 | 66 67 68 69 70 | 0946 0864 0785 0711 0642 | 0938 0856 0778 0704 0635 | 0929 0848 0770 0697 0628 | 0921 0840 0763 0690 0622 | 0913 0832 0755 0683 0615 | 0904 0824 0748 0676 0608 | 0896 0816 0740 0669 0602 | 0888 0808 0733 0632 0595 | 0880 0801 0726 0655 0589 | 0872 0793 0719 0649 0583 | 1 1 1 1 1 | 3 2 2 2 | 4 4 4 3 | 6 5 5 5 4 | 7 6 6 6 6 |
| 1·239 1·257 1·274 1·292 1·309 | 71 72 73 74 75 | 0576 0515 0457 0403 0353 | 0570 0509 0451 0398 0348 | 0564 0503 0446 0393 0343 | 0557 0497 0440 0388 0338 | 0551 0491 0485 0382 0334 | 0545 0485 0429 0377 0329 | 0539 0480 0424 0372 0324 | 0533 0474 0419 0367 0320 | 0527 0468 0413 0363 0315 | 0521 0463 0408 0358 0311 | 1 1 1 1 1 | 2 2 2 2 2 | 3 3 3 2 | 4 4 3 3 | 5 5 4 4 4 |
| 1·326 1·344 1·361 1·379 1·3.6 | 76 77 78 79 80 | 0306 0263 0223 0187 0154 | 0302 0259 0220 0184 0151 | 0297 0255 0216 0180 0148 | 0293 0251 0212 0177 0145 | 0288 0247 0209 0174 0142 | 0284 0243 0205 0170 0139 | 0280 0239 0201 0167 0136 | 0276 0235 0198 0164 0133 | 0271 0231 0194 0161 0130 | 0267 0227 0191 0157 0127 | 1 1 1 1 0 | 1 1 1 1 1 | 2 2 2 2 1 | 3 2 2 2 | 4 3 3 3 2 |
| 1·414 1·431 1·449 1·466 1·484 | 81 82 83 84 85 | 0125 0098 0075 0055 0038 | 0122 0096 0073 0J53 0037 | 0119 0093 0071 0051 0035 | 0116 0091 0069 0050 0034 | 0114 0089 0067 0048 0032 | 0111 0086 0065 0046 0031 | 0108 0084 0063 0045 0030 | 0106 0082 0061 0043 0028 | 0103 0079 0059 0041 0027 | 0101 0077 0057 0040 0026 | 0 0 0 0 0 | 1 1 1 1 0 | 1 1 1 1 1 | 2 2 1 1 1 | 2 2 2 1 1 |
| 1.501 1.518 1.536 1.553 1.571 | 86 87 88 89 90 | 0024 0014 0006 0002 1.0000 | 0023 0013 0006 0001 | 0022 0012 0005 0001 | 0021 0011 0004 0001 | 00°0 0010 0004 0001 | 0019 0010 0003 0000 | 0018 0009 0003 0000 | 0017 0008 0003 0000 | 0016 0007 0002 0000 | 0015 0007 0002 0000 | 0 0 0 0 | 0 0 0 0 | 1 0 0 0 | 1 1 0 0 | 1 1 0 0 |

Radian = 0017 | 0035 | 0052 | 0070 | 0087 | 0105 | 0122 | 0140 | 0137

| _ | | | | | | | | | | | |
|----------------------------|--|--|--|----------------------------|--|--|--|---------------------------------|--|--|--|
| | 0′ | 20′ | 40′ | • | 0′ | 20' | 40′ | 0 | 0′ | 20′ | 40′ |
| 0 | 0.0000 | 0.0058 | 0.0116 | 60 | 1.0000 | 1.0050 | 1.0101 | 120 | 1.7321 | 1.7350 | 1·7378 |
| 1 | 0.0175 | 0.0233 | 0.0291 | 61 | 1.0151 | 1.0201 | 1.0251 | 121 | 1.7407 | 1.7436 | 1·7464 |
| 2 | 0.0349 | 0.0407 | 0.0465 | 62 | 1.0301 | 1.0351 | 1.0400 | 122 | 1.7492 | 1.7521 | 1·7549 |
| 3 | 0.0524 | 0.0582 | 0.0640 | 63 | 1.0450 | 1.0500 | 1.0549 | 123 | 1.7576 | 1.7604 | 1·7632 |
| 4 | 0.0698 | 0.0756 | 0.0814 | 64 | 1.0598 | 1.0648 | 1.0697 | 124 | 1.7659 | 1.7686 | 1·7713 |
| 5 | 0.0872 | 0.0931 | 0.0989 | 65 | 1.0746 | 1.0795 | 1.0844 | 125 | 1.7740 | 1.7767 | 1·7794 |
| 6 | 0·1047 | 0·1105 | 0·1163 | 66 | 1.0893 | 1.0942 | 1.0990 | 126 | 1.7820 | 1.7846 | 1.7873 |
| 7 | 0·1221 | 0·1279 | 0·1337 | 67 | 1.1039 | 1.1087 | 1.1136 | 127 | 1.7899 | 1.7925 | 1.7950 |
| 8 | 0·1395 | 0·1453 | 0·1511 | 68 | 1.1184 | 1.1232 | 1.1280 | 128 | 1.7976 | 1.8001 | 1.8027 |
| 9 | 0·1569 | 0·1627 | 0·1685 | 69 | 1.1328 | 1.1376 | 1.1424 | 129 | 1.8052 | 1.8077 | 1.8101 |
| 10 | 0·1743 | 0·1801 | 0·1859 | 70 | 1.1472 | 1.1519 | 1.1567 | 130 | 1.8126 | 1.8151 | 1.8175 |
| 11 | 0·1917 | 0·1975 | 0.2033 | 71 | 1·1614 | 1·1661 | 1·1709 | 131 | 1.8199 | 1.8223 | 1.8247 |
| 12 | 0·2091 | 0·2148 | 0.2206 | 72 | 1·1756 | 1·1803 | 1·1850 | 132 | 1.8271 | 1.8294 | 1.8318 |
| 13 | 0·2264 | 0·2322 | 0.2380 | 73 | 1·1896 | 1·1943 | 1·1990 | 133 | 1.8341 | 1.8364 | 1.8387 |
| 14 | 0·2437 | 0·2495 | 0.2553 | 74 | 1·2036 | 1·2083 | 1·2129 | 134 | 1.8410 | 1.8433 | 1.8455 |
| 15 | 0·2611 | 0·2668 | 0.2726 | 75 | 1·2175 | 1·2221 | 1·2267 | 135 | 1.8478 | 1.8500 | 1.8522 |
| 16 | 0.2783 | 0·2841 | 0·2899 | 76 | 1·2313 | 1·2359 | 1.2405 | 136 | 1.8544 | 1.8565 | 1.8587 |
| 17 | 0.2956 | 0·3014 | 0·3071 | 77 | 1·2450 | 1·2496 | 1.2541 | 137 | 1.8608 | 1.8630 | 1.8651 |
| 18 | 0.3129 | 0·3186 | 0·3244 | 78 | 1·2586 | 1·2632 | 1.2677 | 138 | 1.8672 | 1.8692 | 1.8713 |
| 19 | 0.3301 | 0·3358 | 0·3416 | 79 | 1·2722 | 1·2766 | 1.2811 | 139 | 1.8733 | 1.8754 | 1.8774 |
| 20 | 0.3473 | 0·3530 | 0·3587 | 80 | 1·2856 | 1·2900 | 1.2945 | 140 | 1.8794 | 1.8814 | 1.8833 |
| 21 22 23 24 25 | 0.3645 0.3816 0.3987 0.4158 0.4329 | 0·3702 0·3873 0·4044 0·4215 0·4386 | 0°3759 0°3930 0°4101 0°4272 0°4442 | 81 82 83 84 85 | 1·2989 1·3121 1·3252 1·3383 1·3512 | 1 3033 1 3165 1 3296 1 3426 1 3555 | 1:3077 1:3209 1:3339 1:3469 1:3597 | 141 142 143 144 145 | 1.8853 1.8910 1.8966 1.9021 1.9074 | 1 8872 1 8929 1 8985 1 9039 1 9092 | 1.8948 1.9003 1.9057 1.9109 |
| 26 | 0.4499 | 0.4556 | 0.4612 | 86 | 1:3640 | 1.3682 | 1:3725 | 146 | 1.9126 | 1.9143 | 1.9160 |
| 27 | 0.4669 | 0.4725 | 0.4782 | 87 | 1:3767 | 1.3809 | 1:3851 | 147 | 1.9176 | 1.9193 | 1.9209 |
| 28 | 0.4838 | 0.4895 | 0.4951 | 88 | 1:3893 | 1.3935 | 1:3977 | 148 | 1.9225 | 1.9241 | 1.9257 |
| 29 | 0.5008 | 0.5064 | 0.5120 | 89 | 1:4018 | 1.4060 | 1:4101 | 149 | 1.9273 | 1.9288 | 1.9303 |
| 30 | 0.5176 | 0.5233 | 0.5289 | 90 | 1:4142 | 1.4183 | 1:4224 | 150 | 1.9319 | 1.9333 | 1.9348 |
| 31 | 0.5345 | 0.5401 | 0.5457 | 91 | 1.4265 | 1·4306 | 1·4346 | 151 | 1.9363 | 1.9377 | 1.9392 |
| 32 | 0.5513 | 0.5569 | 0.5625 | 92 | 1.4387 | 1·4427 | 1·4467 | 152 | 1.9406 | 1.9420 | 1.9434 |
| 33 | 0.5680 | 0.5736 | 0.5792 | 93 | 1.4507 | 1·4547 | 1·4587 | 153 | 1.9447 | 1.9461 | 1.9474 |
| 34 | 0.5847 | 0.5903 | 0.5959 | 94 | 1.4627 | 1·4667 | 1·4706 | 154 | 1.9487 | 1.9500 | 1.9513 |
| 35 | 0.6014 | 0.6070 | 0.6125 | 95 | 1.4746 | 1·4785 | 1·4824 | 155 | 1.9526 | 1.9538 | 1.9551 |
| 36 37 38 39 40 | 0.6180 0.6346 0.6511 0.6676 0.6840 | 0.6236 0.6401 0.6566 0.6731 0.6895 | 0.6291 0.6456 0.6621 0.6786 0.6950 | 96 97 98 99 | 1.4863 1.4979 1.5094 1.5208 1.5321 | 1.4902 1.5018 1.5132 1.5246 1.5358 | 1:4941 1:5056 1:5170 1:5283 1:5395 | 156 157 158 159 160 | 1.9563 1.9598 1.9633 1.9665 1.9696 | 1.9575 1.9610 1.9644 1.9676 1.9706 | 1.9587 1.9621 1.9654 1.9686 1.9716 |
| 41 | 0.7004 | 0.7059 | 0.7113 | 101 | 1.5432 | 1.5469 | 1.5506 | 161 | 1.9726 | 1.9735 | 1.9745 |
| 42 | 0.7167 | 0.7222 | 0.7276 | 102 | 1.5543 | 1.5579 | 1.5616 | 162 | 1.9754 | 1.9763 | 1.9772 |
| 43 | 0.7330 | 0.7384 | 0.7438 | 103 | 1.5652 | 1.5688 | 1.5724 | 163 | 1.9780 | 1.9789 | 1.9797 |
| 44 | 0.7492 | 0.7546 | 0.7600 | 104 | 1.5760 | 1.5796 | 1.5832 | 164 | 1.9805 | 1.9813 | 1.9821 |
| 45 | 0.7654 | 0.7707 | 0.7761 | 105 | 1.5867 | 1.5902 | 1.5938 | 165 | 1.9829 | 1.9836 | 1.9844 |
| 46 | 0.7815 | 0.7868 | 0.7922 | 106 | 1.5973 | 1.6008 | 1.6042 | 166 | 1.9851 | 1.9858 | 1*9865 |
| 47 | 0.7975 | 0.8028 | 0.8082 | 107 | 1.6077 | 1.6112 | 1.6146 | 167 | 1.9871 | 1.9878 | 1*9884 |
| 48 | 0.8135 | 0.8188 | 0.8241 | 108 | 1.6180 | 1.6214 | 1.6248 | 168 | 1.9890 | 1.9896 | 1*9902 |
| 49 | 0.8294 | 0.8347 | 0.8400 | 109 | 1.6282 | 1.6316 | 1.6350 | 169 | 1.9908 | 1.9913 | 1*9919 |
| 50 | 0.8452 | 0.8505 | 0.8558 | 110 | 1.6383 | 1.6416 | 1.6450 | 170 | 1.9924 | 1.9929 | 1*9934 |
| 51 | 0.8610 | 0.8663 | 0.8715 | 111 | 1.6483 | 1.6515 | 1.6548 | 171 | 1.9938 | 1.9943 | 1.9947 |
| 52 | 0.8767 | 0.8820 | 0.8872 | 112 | 1.6581 | 1.6613 | 1.6646 | 172 | 1.9951 | 1.9955 | 1.9959 |
| 53 | 0.8924 | 0.8976 | 0.9028 | 113 | 1.6678 | 1.6710 | 1.6742 | 173 | 1.9963 | 1.9966 | 1.9969 |
| 54 | 0.9080 | 0.9132 | 0.9183 | 114 | 1.6773 | 1.6805 | 1.6836 | 174 | 1.9973 | 1.9976 | 1.9978 |
| 55 | 0.9235 | 0.9287 | 0.9338 | 115 | 1.6868 | 1.6899 | 1.6930 | 175 | 1.9981 | 1.9983 | 1.9986 |
| 56 | 0.9389 | 0.9441 | 0.9492 | 116 | 1.6961 | 1.6992 | 1.7022 | 176 | 1.9988 | 1.9990 | 1.9992 |
| 57 | 0.9543 | 0.9594 | 0.9645 | 117 | 1.7053 | 1.7083 | 1.7113 | 177 | 1.9993 | 1.9995 | 1.9996 |
| 58 | 0.9696 | 0.9747 | 0.9798 | 118 | 1.7143 | 1.7173 | 1.7203 | 178 | 1.9997 | 1.9998 | 1.9999 |
| 59 | 0.9848 | 0.9899 | 0.9950 | 119 | 1.7233 | 1.7262 | 1.7291 | 179 | 1.9999 | 2.0000 | 2.0000 |
| 60 | 1.0000 | 1.0050 | 1.0101 | 120 | 1.7321 | 1.7350 | 1.7378 | 180 | 2.0000 | 2.0000 | 2.0000 |

| Dograd | Radian. | Sine. | Tangout | Cosine. | | Logarithm of | |
|--|--|--|---|--|--|--|---|
| Degree. | radian. | 6 | Tangent. | Cosme. | Sine. | Tangent. | Cosine. |
| 5·73 6·30 6·88 7·45 8·02 8·59 | ·10 ·11 ·12 ·13 ·14 ·15 | **0998 **1098 **1197 **1296 **1395 **1494 | 1003 1104 1206 1307 1409 | *9973 *9940 *9928 *9916 *9902 *9888 | 2·9993 1·0405 1·0781 1·1127 1·1447 1·1745 | 1.0015 1.0431 1.0813 1.1164 1.1490 1.1794 | 1.9978 11.9974 11.9969 11.9963 11.9957 11.9951 |
| 9·17 9·74 10·31 10·89 11·46 | *16 *17 *18 *19 *20 | •1593 •1692 •1790 •1889 •1987 | 1614 1717 1820 1923 2027 | *9872 *9856 *9839 *9820 *9801 | #2023 #2284 #2529 #2761 #2981 | ":2078 ":2347 ":2600 ":2840 ":3069 | 11.9944 11.9937 11.9929 11.9921 11.9913 |
| 12.03 12.61 13.18 13.75 14.32 | ·21 ·22 ·23 ·24 ·25 | *2085 *2182 *2280 *2377 *2474 | °2131 °2236 °2341 °2447 °2553 | *9780 *9759 *9737 *9713 *9689 | 11:3190 11:3389 11:3579 11:3760 11:3934 | 11:3287 11:3495 11:3695 11:3887 11:4071 | 11°9904 11°9894 11°9884 11°9874 11°9863 |
| 14:90 15:47 16:04 16:62 17:19 | ·26 ·27 ·28 ·29 ·30 | *2571 *2667 *2764 *2859 *2955 | *2660 *2768 *2876 *2984 *3093 | *9664 *9638 *9611 *9583 *9553 | "4101 "4261 "4415 "4563 "4706 | 11.4249 11.4421 11.4587 11.4748 11.4904 | 11.9852 11.9840 11.9827 11.9815 11.9802 |
| 17.76 18.33 18.91 19.48 20.05 | ·31 ·32 ·33 ·34 ·35 | *3051 *3146 *3240 *3335 *3429 | 3203 3314 3425 3537 3650 | *9523 *9492 *9460 *9428 *9394 | "*4844 "*4977 "*5106 "*5231 | 11.5056 11.5203 11.5347 11.5487 11.5623 | 11.9788 11.9774 11.9759 11.9744 11.9728 |
| 20.63 21.20 21.77 22.34 22.92 | ·36 ·37 ·38 ·39 ·40 | 3523 3616 3709 3802 3894 | 3764 3879 3994 4111 4228 | *9359 *9323 *9287 *9249 *9211 | 11.5469 11.5582 11.5693 11.5800 11.5904 | "5757 "5887 "6014 "6139 | 11*9712 11*9696 11*9679 11*9661 11*9643 |
| 23·49 24·06 24·64 25·21 25·78 | ·41 ·42 ·43 ·44 ·45 | *3986 *4078 *4169 *4259 *4350 | '4346 '4466 '4586 '4708 '4831 | *9171 *9131 *9090 *9048 *9005 | 11.6005 11.6104 11.6200 11.6293 11.6385 | "6381 "6499 "6615 "6728 "6840 | 11°9624 11°9605 11°9586 11°9565 11°9545 |
| 26·36 26·93 27·50 28·07 28·65 | ·46 ·47 ·48 ·49 ·50 | •4439 •4529 •4618 •4706 •4794 | *4954 *5080 *5206 *5334 *5463 | *8961 *8916 *8870 *8823 *8776 | 11.6473 11.6560 11.6644 11.6727 11.6807 | ".*6950 ".*7058 ".*7165 ".*7270 | 11°9523 11°9502 11°9479 11°9456 11°9433 |
| 29·22 29·79 30·37 30·94 31·51 | ·51 ·52 ·53 ·54 ·55 | *4882 *4969 *5055 *5141 *5227 | *5594 *5726 *5859 *5994 *6131 | *8727 *8678 *8628 *8577 *8525 | "6886 "6962 "7037 "7111 "7182 | ".7477 ".7578 ".7678 ".7777 ".7875 | 11.9409 11.9384 11.9359 11.9307 |
| 32·09 32·66 33·23 33·80 34·37 | ·56 ·57 ·58 ·59 ·60 | *5312 *5396 *5480 *5564 *5646 | *6269 *6410 *6552 *6696 *6841 | *8473 *8419 *8365 *8309 *8253 | "'7253 "'7321 "'7388 "'7454 "'7518 | ".*7972 ".*8068 ".*8164 ".*8258 ".*8351 | 11*9280 11*9253 11*9224 11*9196 11*9166 |

| | Dadien | Sine. | The second | Ct | 1 | Logarithms of | r , |
|----------------|------------|----------------|------------------|----------------|----------------------|--------------------|--------------------|
| Degree. | Radian. | Sine. | Tangent. | Cosine. | Sine. | Tangent. | Cosine |
| 34.38 | -60 | *5646 | 0.6841 | *8253 | Ī·7518 | ī·8351 | 1.9166 |
| 34 95 | ·61 | *5720 | 0.6989 | *8196 | ıı·7581 | 11.8444 | 11.9136 |
| 35.2 | .62 | 5810 | 0.7139 | *8139 | 11.7642 | 11.8536 | 11.9106 |
| 36·10 36·67 | ·63 ·64 | ·5891 ·5972 | 0·7291 0·7445 | *8080 *8021 | 11.7702 11.7761 | 11.8628 11.8719 | 11.9074 |
| 37.24 | -65 | 6052 | 0.7602 | 7961 | 77819 | 11.8809 | 11.3010 |
| 37.82 | ·63 ·67 | ·6131 ·6210 | 0.7761 0.7923 | *7900 | 11.7875 | 11.8899 | 11.8976 |
| 38·39 38·39 | -68 | 6288 | 0.8087 | •7838 •7776 | 11.7931 11.7985 | 11.8989 11.9078 | 11'8942 |
| 39.53 | -69 | :6365 | 0.8253 | .7712 | 11.8038 | 11.9166 | 11.8872 |
| 40.11 | .70 | 6142 | 0.8423 | ·7648 | 11.8090 | n*9255 | 11.8836 |
| 40.68 41.25 | ·71 ·72 | 6518 6594 | 0.8595 0.8771 | *7584 *7518 | "8141 "8191 | 11*9343 11*9430 | 11.8799 11.8761 |
| 41.83 | .73 | *6669 | 0.8949 | ·7452 | 11.8240 | 11.9430 | 11.8723 |
| 42.40 | ·74 ·75 | 6743 | 0.9131 | *7385 | ıı·8288 | 11.9605 | 11.8683 |
| 42.97 | •75 | .6816 | 0.9316 | .7317 | n*8336 | 11.9092 | 11.8648 |
| 43.54 | ·76 | .6889 | 0.9505 | ·7248 | 11.8383 | 11.9779 | 11.8605 |
| 44.12 | ·77 | 6)61 | 0.9697 | •7179 | 11.8427 | 11.9866 | n°8561 |
| 44.69 45.26 | .79 | ·7033 ·7104 | 0.9893 1.0092 | ·7109 ·7038 | ii. 8471 ii. 8515 | 0.0040 | 11°8518 |
| 45.84 | .80 | •7174 | 1.0296 | .6967 | 11.8557 | 0.0127 | 11.8430 |
| 46.41 | ·81 | ·7243 | 1.0505 | 6895 | ···8599 | 0.0214 | 11.838 |
| 46.98 47.56 | ·82 ·83 | ·7311 ·7379 | 1.0717 1.0934 | ·6822 ·6749 | 11.8640 11.8680 | 0.0388 | 11.8339 11.8295 |
| 48.13 | -84 | .7446 | 1.1156 | 6675 | 11.8720 | 0.0475 | 11 829 |
| 48.70 | .85 | •7513 | -1.1383 | .660) | 11.8758 | 0.0563 | 11.819 |
| 49.27 | -86 | •7578 | 1.1616 | *6524 | 11.8796 | 0.0650 | ıı*8143 |
| 49.85 50.42 | *87 *88 | *7643 *7707 | 1·1853 1·2097 | *6448 *6372 | 11.8833 | 0.0738 | 11.8094 |
| 50.99 | -89 | •7771 | 1.2346 | 6294 | 11.8905 | 0.0915 | 11.7989 |
| 51.57 | .90 | ·7833 | 1.2602 | .6216 | n*8939 | 0.1004 | n·7935 |
| 52.14 | -91 | *7895 | 1.2864 | . 6137 | 11.8974 | 0.1094 | 11.7880 |
| 52.71 53.29 | ·92 ·93 | ·7956 ·8016 | 1·3133 1·3409 | *6058 *5978 | 11.9007 | 0·1184 0·1274 | 11.7823 |
| 53.86 | .94 | *8076 | 1.3692 | 5898 | 11 9040 | 0.1365 | 11:7707 |
| 54.43 | .95 | *8134 | 1.3984 | •5817 | ".9103 | C·1456 | 11.7707 11.7647 |
| 55.00 | .93 | *8192 | 1.4284 | *5735 | 11.9134 | 0.1548 | 11.7588 |
| 55.58 56.15 | •37 •93 | *8249 *8305 | 1·4592 1·4909 | *5653 *5570 | 11.9164 | 0·1641 0·1735 | 11:7528 |
| 56.72 | .99 | .8360 | 1.5237 | *5487 | 11.9222 | 0.1829 | ıı·7393 |
| 57:30 | 1.00 | *8415 | 1.5574 | *5403 | 11*9250 | 0.1924 | 11.732€ |
| 57.87 | 1.01 | *8468 *8521 | 1.5922 | *5319 | 11.9278 11.9305 | 0.2020 0.2117 | 11.7258 |
| 58·44 59·01 | 1.03 | *8573 | 1.6281 1.6653 | ·5234 ·5148 | 11.9309 | 0.2215 | ,,.7188 ,,.7117 |
| 59.59 | 1.04 | *8624 | 1.7036 | •5062 | u·9357 | 0·2314 0·2414 | 11.7043 |
| 60.16 | | *8674 | 1.7433 | ·4976 | 11*9382 | | 11.6969 |
| 60.73 | 1.06 | *8724 *8772 | 1.7844 1.8270 | ·4889 ·4801 | 11.9407 11.9431 | 0·2515 0·2618 | 11.6892 11.6814 |
| 61.88 | 1.08 | *8820 | 1.8712 | 4713 | 11 9451 | 0.2721 | 11.6738 |
| 62.45 | 1.09 | *8866 | 1.9171 | ·4625 | 11.9477 | 0.2826 | 11.6651 |
| 63 03 | 1.10 | *8912 | 1.9648 | *4536 | 11.9200 | 0.2933 | 11*6567 |

| Daguag | Radian. | Sine. | Tangont | Cosine, | 1 | Logarithms o | f |
|---|--------------------------------------|---|---|---|---|--|----------------------------------|
| Degree. | Radian. | ыше. | Tangent. | Cosme. | Sine. | Tangent. | Cosine. |
| 63°03 | 1·10 | *8912 | 1.965 | *4536 | 1·9500 | 0·2933 | 1.6567 |
| 63°60 | 1·11 | *8957 | 2.014 | *4447 | 1·9522 | 0·3041 | 1.6480 |
| 64°17 | 1·12 | *9001 | 2.066 | *4357 | 1·9543 | 0·3151 | 1.6392 |
| 64°74 | 1·13 | * 9044 | 2.120 | *4267 | 1·9564 | 0·3263 | 1.6301 |
| 65°32 | 1·14 | *9086 | 2.176 | *4176 | 1·9584 | 0·3376 | 1.6208 |
| 65°89 | 1·15 | *9123 | 2.234 | *4085 | 1·9604 | 0·3492 | 1.6112 |
| 66:46 67:04 67:61 68:18 68:75 | 1·16 1·17 1·18 1·19 1·20 | *9168 *9208 *9246 *9284 *9320 | 2·296 2·360 2·427 2·498 2·572 | ·3993 ·3902 ·3809 ·3717 ·3624 | 11.9623 11.9641 11.9660 11.9677 11.9694 | 0:3609 0:3729 0:3851 0:3976 0:4103 | "5912 "5808 "5701 "5591 |
| 69:33 | 1·21 | *9356 | 2.650 | •3530 | "9711 | 0.4233 | "5478 |
| 69:90 | 1·22 | *9391 | 2.733 | •3436 | "9727 | 0.4366 | "5361 |
| 70:47 | 1·23 | *9425 | 2.820 | •3342 | "9743 | 0.4502 | "5241 |
| 71:05 | 1·24 | *9458 | 2.912 | •3248 | "9758 | 0.4642 | "5116 |
| 71:62 | 1·25 | *9490 | 3.010 | •3153 | "9773 | 0.4785 | "4988 |
| 72·19 | 1·26 | *9521 | 3·113 | *3058 | "9787 | 0·4932 | "4855 |
| 72·77 | 1·27 | *9551 | 3·224 | *2963 | "9800 | 0·5083 | "4717 |
| 73·34 | 1·28 | *9580 | 3·341 | *2867 | "9814 | 0·5239 | "4575 |
| 73·91 | 1·29 | *9608 | 3·467 | *2771 | "9826 | 0·5400 | "4427 |
| 74·48 | 1·30 | *9636 | 3·602 | *2675 | "9839 | 0·5566 | "4273 |
| 75.06 | 1·31 | *9662 | 3.747 | •2579 | 11.9851 | 0·5737 | 11:4114 |
| 75.63 | 1·32 | *9687 | 3.903 | •2482 | 11.9862 | 0·5914 | 11:3948 |
| 76.20 | 1·33 | *9712 | 4.072 | •2385 | 11.9873 | 0·6098 | 11:3774 |
| 76.78 | 1·34 | *9735 | 4.256 | •2288 | 11.9883 | 0·6290 | 11:3594 |
| 77.35 | 1·35 | *9757 | 4.455 | •2190 | 11.9893 | 0·6489 | 11:3405 |
| 77.92 | 1·36 | *9779 | 4.674 | ·2092 | 11*9903 | 0.6696 | 11.3206 |
| 78.50 | 1·37 | *9799 | 4.913 | ·1995 | 11*9912 | 0.6914 | 11.2998 |
| 79.07 | 1·38 | *9819 | 5.177 | ·1896 | 11*9920 | 0.7141 | 11.2779 |
| 79.64 | 1·39 | *9837 | 5.471 | ·1798 | 11*9929 | 0.7380 | 11.2548 |
| 80.21 | 1·40 | *9854 | 5.798 | ·1700 | 11*9936 | 0.7633 | 11.2304 |
| 80·79 | 1·41 | *9871 | 6·165 | 1601 | 11:9944 | 0.7900 | "2044 |
| 81·36 | 1·42 | *9886 | 6·581 | 1502 | 11:9950 | 0.8183 | "1767 |
| 81·93 | 1·43 | *9901 | 7·055 | 1403 | 11:9957 | 0.8485 | "1472 |
| 82·51 | 1·44 | *9915 | 7·619 | 1304 | 11:9963 | 0.8819 | "1154 |
| 83·08 | 1·45 | *9927 | 8·238 | 1205 | 11:9968 | 0.9158 | "0810 |
| 83.65 | 1.46 | *9939 | 8.989 | ·1106 | "*9973 | 0.9537 | "·0436 |
| 84.23 | 1.47 | *9949 | 9.887 | ·1006 | "*9978 | 0.9951 | "·0027 |
| 84.80 | 1.48 | *9959 | 10.984 | ·0907 | "*9982 | 1.0407 | 2·9575 |
| 85.37 | 1.49 | *9967 | 12.350 | ·0807 | "*9986 | 1.0917 | "·9069 |
| 85.94 | 1.50 | *9975 | 14.101 | ·0707 | "*9989 | 1.1493 | "·8497 |
| 86·52 | 1.51 | *9982 | 16·428 | *0608 | 11*9992 | 1 ·2156 | "'7836 |
| 87·09 | 1.52 | *9987 | 19·670 | *0508 | 11*9994 | 1 ·2938 | "'7056 |
| 87·66 | 1.53 | *9992 | 24·499 | *0408 | 11*9996 | 1 ·3891 | "'6105 |
| 88·24 | 1.54 | *9995 | 33·138 | *0302 | 11*9998 | 1 ·5203 | "'4795 |
| 88·81 | 1.55 | *9998 | 48·101 | *0208 | 11*9999 | 1 ·6821 | "'3178 |
| 89·38 89·95 90·00 | 1·56 1·57 π/2 | *9999 1.0000 1.0000 | 92.623 1255.866 ∞ | *0108 *0080 *0000 | 0.0000 0.0000 0.0000 | 1.9667 3.0989 +∞ | 3.9011 -∞ |

| n | n-1 | n ² | n³ | √n | √10n | ³ ∕n | ³ √10n | Diff. | ³ ∕100n |
|------------------------|---------------------------------------|------------------------------|-----------------------------------|---|--------------------------------------|---|--|---|--|
| 1 | 1 | 1 | 1 | 1 | 3·1623 | 1 | 2:1544 | th the preced. t, this table of may be used lation. | 4.6416 |
| 2 | *5 | 4 | 8 | 1·4142 | 4·4721 | 1·2599 | 2:7144 | | 5.8480 |
| 3 | *3333333 | 9 | 27 | 1·7321 | 5·4772 | 1·4422 | 3:1072 | | 6.6943 |
| 4 | *25 | 16 | 64 | 2 | 6·3246 | 1·5874 | 3:4200 | | 7.3681 |
| 5 | *2 | 25 | 125 | 2·2361 | 7·0711 | 1·7100 | 3:6840 | | 7.9370 |
| 6 7 8 9 10 | *166667 *142857 *125 *111111 | 36 49 64 81 1 00 | 216 343 512 729 1 000 | 2.4495 2.6458 2.8284 3 3.1623 | 7.7460 8.3666 8.9443 9.4868 | 1.8171 1.9129 2 2.0801 2.1544 | 3·9149 4·1213 4·3089 4·4814 4·6416 | Along with the p fing column, this tack differences may be for interpolation. | 8·4343 8·8790 9·2832 9·6549 10 |
| 11 | *090909 | 1 21 | 1 331 | 3·3166 | 10.488 | 2·2240 | 4·7914 | 1410 | 10°323 |
| 12 | *083333 | 1 44 | 1 728 | 3·4641 | 10.954 | 2·2894 | 4·9324 | 1334 | 10°627 |
| 13 | *076923 | 1 69 | 2 197 | 3·6056 | 11.402 | 2·3513 | 5·0658 | 1267 | 10°914 |
| 14 | *071429 | 1 96 | 2 744 | 3·7417 | 11.832 | 2·4101 | 5·1925 | 1208 | 11°187 |
| 15 | *066667 | 2 25 | 3 375 | 3·8730 | 12.247 | 2·4662 | 5·3133 | 1155 | 11°447 |
| 16 | *0625 | 2 56 | 4 096 | 4 | 12.649 | 2·5198 | 5·4288 | 1109 | 11.696 |
| 17 | *058824 | 2 89 | 4 913 | 4·1231 | 13.038 | 2·5713 | 5·5397 | 1065 | 11.935 |
| 18 | *055556 | 3 24 | 5 832 | 4·2426 | 13.416 | 2·6207 | 5·6462 | 1027 | 12.164 |
| 19 | *052632 | 3 61 | 6 859 | 4·3589 | 13.784 | 2·6684 | 5·7489 | 991 | 12.386 |
| 20 | *05 | 4 00 | 8 000 | 4·4721 | 14.142 | 2·7144 | 5·8480 | 959 | 12.599 |
| 21 | 047619 | 4 41 | 9 261 | 4.5826 | 14·491 | 2.7589 | 5.9439 | 929 | 12:806 |
| 22 | *045455 | 4 84 | 10 648 | 4.6904 | 14·832 | 2.8020 | 6.0368 | 901 | 13:006 |
| 23 | *043478 | 5 29 | 12 167 | 4.7958 | 15·166 | 2.8439 | 6.1269 | 876 | 13:200 |
| 24 | *041667 | 5 76 | 13 824 | 4.8990 | 15·492 | 2.8845 | 6.2145 | 851 | 13:389 |
| 25 | *04 | 6 25 | 15 625 | 5 | 15·811 | 2.9240 | 6.2996 | 829 | 13:572 |
| 26 | *038462 | 6 76 | 17 576 | 5·0990 | 16·125 | 2·9625 | 6·3825 | 808 | 13.751 |
| 27 | *037037 | 7 29 | 19 683 | 5·1962 | 16·432 | 3 | 6·4633 | 788 | 13.925 |
| 28 | *035714 | 7 84 | 21 952 | 5·2915 | 16·733 | 3·0366 | 6·5421 | 770 | 14.095 |
| 29 | *034483 | 8 41 | 24 389 | 5·3852 | 17·029 | 3·0723 | 6·6191 | 752 | 14.260 |
| 30 | *033333 | 9 00 | 27 000 | 5·4772 | 17·321 | 3·1072 | 6·6943 | 736 | 14.422 |
| 31 | *032258 | 9 61 | 29 791 | 5.5678 | 17.607 | 3·1414 | 6·7679 | 720 | 14.581 |
| 32 | *03125 | 10 24 | 32 768 | 5.6569 | 17.889 | 3·1748 | 6·8399 | 705 | 14.736 |
| 33 | *030303 | 10 89 | 35 937 | 5.7446 | 18.166 | 3·2075 | 6·9104 | 691 | 14.888 |
| 34 | *029412 | 11 56 | 39 304 | 5.8310 | 18:439 | 3·2396 | 6·9795 | 688 | 15.037 |
| 35 | *028571 | 12 25 | 42 875 | 5.9161 | 18.708 | 3·2711 | 7·0473 | 665 | 15.183 |
| 36 | *027778 | 12 96 | 46 656 | 6 | 18·974 | 3·3019 | 7:1138 | 653 | 15·326 |
| 37 | *027027 | 13 69 | 50 653 | 6*0828 | 19·235 | 3·3322 | 7:1791 | 641 | 15·467 |
| 38 | *026316 | 14 44 | 54 872 | 6*1644 | 19·494 | 3·3620 | 7:2432 | 629 | 15·605 |
| 39 | *025641 | 15 21 | 59 319 | 6*2450 | 19·748 | 3·3912 | 7:3001 | 620 | 15·741 |
| 40 | *025 | 16 00 | 64 000 | 6*3246 | 20 | 3·4200 | 7:3681 | 609 | 15·874 |
| 41 | *024390 | 16 81 | 68 921 | 6·4031 | 20°248 | 3.4482 | 7·4290 | 599 | 16.005 |
| 42 | *023810 | 17 64 | 74 088 | 6·4807 | 20°494 | 3.4760 | 7·4889 | 589 | 16.134 |
| 43 | *023256 | 18 49 | 79 507 | 6·5574 | 20°736 | 3.5034 | 7·5478 | 581 | 16.261 |
| 44 | *022727 | 19 36 | 85 184 | 6·6332 | 20°976 | 3.5303 | 7·6059 | 572 | 16.386 |
| 45 | *022222 | 20 25 | 91 125 | 6·7082 | 21°213 | 3.5569 | 7·6631 | 563 | 16.510 |
| 46 | *021739 | 21 16 | 97 336 | 6.7823 | 21:448 | 3·5830 | 7·7194 | 556 | 16.631 |
| 47 | *021277 | 22 09 | 103 823 | 6.8557 | 21:679 | 3·6088 | 7·7750 | 547 | 16.751 |
| 48 | *020833 | 23 04 | 110 592 | 6.9282 | 21:909 | 3·6342 | 7·8297 | 540 | 16.869 |
| 49 | *020408 | 24 01 | 117 649 | 7 | 22:136 | 3·6593 | 7·8837 | 533 | 16.985 |
| 50 | *02 | 25 00 | 125 000 | 7.0711 | 22:361 | 3·6840 | 7·9370 | 526 | 17.100 |

| n-1 | n ² | n3 | √n | √10n | ∛n | ³ √10n | Diff. | ³ √100n |
|--|--|--|--------------------------------------|--|--|--|--------------------------|--|
| *019608 | 26 01 | 132 651 | 7:1414 | 22·593 | 3·7084 | 7:9896 | 519 | 17·213 |
| *019231 | 27 04 | 140 608 | 7:2111 | 22·804 | 3·7325 | 8:0415 | 512 | 17·325 |
| *018868 | 28 09 | 148 877 | 7:2801 | 23·022 | 3·7563 | 8:0927 | 506 | 17·435 |
| *018519 | 29 16 | 157 464 | 7:3485 | 23·238 | 3·7798 | 8:1433 | 499 | 17·544 |
| *018182 | 30 25 | 166 375 | 7:4162 | 23·452 | 3·8030 | 8:1932 | 494 | 17·652 |
| *017857 | 31 36 | 175 616 | 7·4833 | 23.664 | 3·8259 | 8·2426 | 487 | 17.758 |
| *017544 | 32 49 | 185 193 | 7·5498 | 23.875 | 3·8485 | 8·2913 | 483 | 17.863 |
| *017241 | 33 64 | 195 112 | 7·6158 | 24.083 | 3·8709 | 8·3396 | 476 | 17.967 |
| *016949 | 34 81 | 205 379 | 7·6811 | 24.290 | 3·8930 | 8·3872 | 471 | 18.070 |
| *016667 | 36 00 | 216 000 | 7·7460 | 24.495 | 3·9149 | 8·4343 | 466 | 18.171 |
| *016393 | 37 21 | 226 981 | 7·8102 | 24·698 | 3.9365 | 8:4809 | 461 | 18·272 |
| *016129 | 38 44 | 238 328 | 7·8740 | 24·900 | 3.9579 | 8:5270 | 456 | 18·371 |
| *015873 | 39 69 | 250 047 | 7·9373 | 25·100 | 3.9791 | 8:5726 | 451 | 18·469 |
| *015625 | 40 96 | 262 144 | 8 | 25·298 | 4 | 8:6177 | 447 | 18·566 |
| *015385 | 42 25 | 274 625 | 8·0623 | 25·495 | 4.0207 | 8:6624 | 442 | 18·663 |
| *015152 | 43 56 | 287 496 | 8:1240 | 25.690 | 4.0412 | 8.7066 | 437 | 18.758 |
| *014925 | 44 89 | 300 763 | 8:1854 | 25.884 | 4.0615 | 8.7503 | 434 | 18.852 |
| *014706 | 46 24 | 314 432 | 8:2462 | 26.077 | 4.0817 | 8.7937 | 429 | 18.945 |
| *014493 | 47 61 | 328 509 | 8:3066 | 26.268 | 4.1016 | 8.8366 | 424 | 19.038 |
| *014286 | 49 00 | 343 000 | 8:3666 | 26.458 | 4.1213 | 8.8790 | 421 | 19.129 |
| *014085 | 50 41 | 357 911 | 8:4261 | 26.646 | 4·1408 | 8·9211 | 417 | 19·220 |
| *013889 | 51 84 | 373 248 | 8:4853 | 26.833 | 4·1602 | 8·9628 | 413 | 19·310 |
| *013699 | 53 29 | 389 017 | 8:5440 | 27.019 | 4·1793 | 9·0041 | 409 | 19·399 |
| *013514 | 54 76 | 405 224 | 8:6023 | 27.203 | 4·1983 | 9·0450 | 406 | 19·487 |
| *013333 | 56 25 | 421 875 | 8:6603 | 27.386 | 4·2172 | 9·0856 | 402 | 19·574 |
| *013158 | 57 76 | 438 976 | 8·7178 | 27·568 | 4·2358 | 9·1258 | 399 | 19.661 |
| *012987 | 59 29 | 456 533 | 8·7750 | 27·749 | 4·2543 | 9·1657 | 395 | 19.747 |
| *012821 | 60 84 | 474 552 | 8·8318 | 27·928 | 4·2727 | 9·2052 | 391 | 19.832 |
| *012658 | 62 41 | 493 039 | 8·8882 | 28·107 | 4·2908 | 9·2443 | 389 | 19.916 |
| *0125 | 64 00 | 512 000 | 8·9443 | 28·284 | 4·3089 | 9·2832 | 385 | 20 |
| 012346 | 65 61 | 531 441 | 9 | 28:460 | 4·3267 | 9:3217 | 382 | 20.083 |
| 012195 | 67 24 | 551 368 | 9·0554 | 28:636 | 4·3445 | 9:3599 | 379 | 20.165 |
| 012048 | 68 89 | 571 787 | 9·1104 | 28:810 | 4·3621 | 9:3978 | 376 | 20.247 |
| 011905 | 70 56 | 592 704 | 9·1652 | 28:983 | 4·3795 | 9:4354 | 373 | 20.328 |
| 011765 | 72 25 | 614 125 | 9·2195 | 29:155 | 4·3968 | 9:4727 | 370 | 20.408 |
| *011628 | 73 96 | 636 056 | 9·2736 | 29·326 | 4.4140 | 9·5097 | 367 | 20·488 |
| *011494 | 75 69 | 658 503 | 9·3274 | 29·496 | 4.4310 | 9·5464 | 364 | 20·567 |
| *011364 | 77 44 | 681 472 | 9·3808 | 29·665 | 4.4480 | 9·5828 | 362 | 20·646 |
| *011236 | 79 21 | 704 969 | 9·4340 | 29·833 | 4.4647 | 9·6190 | 359 | 20·724 |
| *011111 | 81 00 | 729 000 | 9·4868 | 30 | 4.4814 | 9·6549 | 357 | 20·801 |
| *010989 | 82 81 | 753 571 | 9·5394 | 30·166 | 4·4979 | 9.6905 | 354 | 20.878 |
| *010870 | 84 64 | 778 688 | 9·5917 | 30·332 | 4·5144 | 9.7259 | 351 | 20.954 |
| *010753 | 86 49 | 804 357 | 9·6437 | 30·496 | 4·5307 | 9.7610 | 349 | 21.029 |
| *010638 | 88 36 | 830 584 | 9·6954 | 30·659 | 4·5468 | 9.7959 | 346 | 21.105 |
| *010526 | 90 25 | 857 375 | 9·7468 | 30·822 | 4·5629 | 9.8305 | 343 | 21.179 |
| *010417 *010309 *010204 *010101 | 92 16 94 09 96 04 98 01 100 00 | 884 736 912 673 941 192 970 299 1000 000 | 9.7980 9.8489 9.8995 9.9499 | 30.984 31.145 31.305 31.464 31.623 | 4·5789 4·5947 4·6104 4·6261 4·6416 | 9.8648 9.8990 9.9329 9.9666 10 | 342 339 337 334 | 21·253 21·327 21·400 21·472 21·544 |
| | 019608 019231 018589 018519 018182 017857 017544 017241 016949 016667 016398 016129 015873 015152 014706 014493 014286 014493 014286 013889 013899 013514 013333 018158 01295 0170585 01204 01101586 01101696 011111 010989 011864 0111236 0111965 0110989 010975 0100753 010038 | | | O19608 | O19608 | O19608 | O19608 | -019608 |

The reciprocals are given to the first four figures, no account being taken of 'place-value.'

| Number. | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | | Me | | Dif sub | | | es to | o be | е |
|----------------------------------|--|--|--|--|--|--|--|--|--|--|-----------------------|-----------------------|----------------------------------|-----------------------|----------------------------------|----------------------------------|----------------------------|----------------------------------|----------------------------------|
| Nun | | | | | | | | | - | 3 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 10 11 12 13 14 15 | 1000 9091 8333 7692 7143 6667 | 9901 9009 8264 7634 7092 6623 | 9804 8929 8197 7576 7042 6579 | 9709 8850 8130 7519 6993 6536 | 9615 8772 8065 7463 6944 6494 | 9524 8696 8000 7407 6897 6452 | 9434 8621 7937 7353 6849 6410 | 9346 8547 7874 7299 6803 6369 | 9259 8475 7813 7246 6757 6329 | 9174 8403 7752 7194 6711 6289 | 9 8 6 5 4 | | 27 23 19 16 14 13 | 30 26 22 19 | 45 38 32 27 24 21 | 55 45 38 33 29 25 | 53 45 38 33 | 73 61 51 44 38 33 | 82 68 58 49 43 38 |
| 16 17 18 19 20 | 6250 5882 5556 5263 5000 | 6211 5848 5525 5236 4975 | 6173 5814 5495 5208 4950 | 6135 5780 5464 5181 4926 | 6098 5747 5435 5155 4902 | 6061 5714 5405 5128 4878 | 6024 5682 5376 5102 4854 | 5988 5650 5348 5076 4831 | 5952 5618 5319 5051 4808 | 5917 5587 5291 5025 4785 | 4 3 3 3 2 | 7 6 5 5 | 11 10 9 8 7 | 13 12 11 | 18 16 15 13 12 | 22 20 18 16 14 | | 29 26 23 21 19 | 33 29 26 24 21 |
| 21 22 23 24 25 | 4762 4545 4348 4167 4000 | 4739 4525 4329 4149 3984 | 4717 4505 4310 4132 3968 | 4695 4484 4292 4115 3953 | 4673 4464 4274 4098 3937 | 4651 4444 4255 4082 3922 | 4630 4425 4237 4065 3906 | 4608 4405 4219 4049 3891 | 4587 4386 4202 4032 3876 | 4566 4367 4184 4016 3861 | 2 2 2 2 2 | 4 4 3 3 | 7 6 5 5 5 | 9 8 7 7 6 | | 13 12 11 10 9 | 14 13 12 | 17 16 14 13 12 | 20 18 16 15 14 |
| 26 27 28 29 30 | 3846 3704 3571 3448 3333 | 3831 3690 3559 3436 3322 | 3817 3676 3546 3425 3311 | 3802 3663 3534 3413 3300 | 3788 3650 3521 3401 3289 | 3774 3636 3509 3390 3279 | 3759 3623 3497 3378 3268 | 3745 3610 3484 3367 3257 | 3731 3597 3472 3356 3247 | 3717 3584 3460 .3344 3236 | 1 1 1 1 | 3 2 2 2 | 4 4 3 3 | 6 5 5 4 | 7 7 6 6 5 | 9 8 7 7 6 | 9 | 11 11 10 9 9 | |
| 31 32 33 34 35 | 3226 3125 3030 2941 2857 | 3215 3115 3021 2933 2849 | 3205 3106 3012 2924 2841 | 3195 3096 3003 2915 2833 | 3185 3086 2994 2907 2825 | 3175 3077 2985 2899 2817 | 3165 3067 2976 2890 2809 | 3155 3058 2967 2882 2801 | 3145 3049 2959 2874 2793 | 3135 3040 2950 2865 2786 | 1 1 1 1 | 2 2 2 2 | 3 3 3 2 | 4 4 3 3 | 5 5 4 4 4 | 6 6 5 5 5 | 7 7 6 6 6 | 8 8 7 7 6 | 9 9 8 8 7 |
| 36 37 38 39 40 | 2778 2703 2632 2564 2500 | 2770 2695 2625 2558 2494 | 2762 2688 2618 2551 2488 | 2755 2681 2611 2545 2481 | 2747 2674 2604 2538 2475 | 2740 2667 2597 2532 2469 | 2732 2660 2591 2525 2463 | 2725 2653 2584 2519 2457 | 2717 2646 2577 2513 2451 | 2710 2639 2571 2506 2445 | 1 1 1 1 | 2 1 1 1 1 | 2 2 2 2 | 3 3 3 2 | 4 4 3 3 3 | 5 4 4 4 4 | 5 5 4 4 | 66555 | 7 6 6 6 5 |
| 41 42 43 44 45 | 2439 2381 2326 2273 2222 | 2433 2375 2320 226s 2217 | 2427 2370 2315 2262 2212 | 2421 2364 2309 2257 2208 | 2415 2358 2304 2252 2203 | 2410 2353 2299 2247 2198 | 2404 2347 2294 2242 2193 | 2398 2342 2288 2237 2188 | 2392 2336 2283 2232 2183 | 2387 2331 2278 2227 2179 | 1 1 1 1 0 | 1 1 1 1 | 2 2 2 2 1 | 2 2 2 2 2 | 3 3 3 2 | 3 3 3 3 3 | 4 4 4 4 3 | 5 4 4 4 4 | 5 5 5 5 4 |
| 46 47 48 49 50 | 2174 2128 2083 2041 2000 | 2169 2123 2079 2037 1996 | 2165 2119 2075 2033 1992 | 2160 2114 2070 2028 1988 | 2155 2110 2066 2024 1984 | 2151 2105 2062 2020 1980 | 2146 2101 2058 2016 1976 | 2141 2096 2053 2012 1972 | 2137 2092 2049 2008 1969 | 2132 2088 2045 2004 1965 | 0 0 0 0 | 1 1 1 1 1 | 1 1 1 1 | 2 2 2 2 2 | 2 2 2 2 2 | 3 3 2 2 | 3 3 3 3 3 | 4 3 3 3 | 4 4 4 4 |
| 51 52 53 54 55 | 1961 1923 1887 1852 1818 | 1957 1919 1883 1848 1815 | 1953 1916 1880 1845 1812 | 1949 1912 1876 1842 1808 | 1946 1908 1873 1838 1805 | 1942 1905 1869 1835 1802 | 1938 1901 1866 1832 1799 | 1934 1898 1862 1828 1795 | 1931 1894 1859 1825 1792 | 1927 1890 1855 1821 1789 | 0 0 0 0 | 1 1 1 1 1 | 1 1 1 1. | 2 1 1 1 1 | 2 2 2 2 2 | 2 2 2 2 2 | 3 2 2 2 | 3 3 3 3 | 3 3 3 3 3 |
| 56 57 58 59 60 | 1786 1754 1724 1695 1667 | 1783 1751 1721 1692 1664 | 1779 1748 1718 1689 1661 | 1776 1745 1715 1686 1658 | 1773 1742 1712 1684 1656 | 1770 1739 1709 1681 1653 | 1767 1736 1706 1678 1650 | 1764 1733 1704 1675 1647 | 1761 1730 1701 1672 1645 | 1757 1727 1698 1669 1642 | 0 0 0 0 | 1 1 1 1 | 1 1 1 1 | 1 1 1 1 | 2 2 1 1 1 | 2 2 2 2 | 2 2 2 2 2 2 | 3 2 2 2 2 2 | 3 3 3 2 |

The reciprocals are given to the first four figures, no account being taken of 'place-value.'

| | 1 | 1 | 1 | 1 | 1 | V | 1 | 1 | 1 | 1 | 1 | 1 | | | | |
|------------|--------------|--------------|--------------|--------------|------------------------------|----------------|--------------|----------------------|--------------|--------------|----------|---------------------------------|---------------------------------|---------------------------------|--------------------------------------|--------------------------------------|
| er. | | | | | | | | | | | | Pr | ime N | os, from | 101 to | 2011. |
| Number. | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Diff. | 101 103 107 109 113 | 421 431 433 439 443 | 787 797 809 811 821 | 1181 1187 1193 1201 1213 | 1583 1597 1601 1607 1609 |
| 60 | 1667 | 1664 | 1661 | 1658 | 165t | 1653 | 1650 | 1647 | 1645 | 1642 | 3 | 127 | 449 | 823 | 1217 | 1613 |
| 61 | 1639 | 1637 | 1634 | 1631 | 1629 | 1626 | 1623 | 1621 | 1618 | 1616 | 3 | 131 | 457 | 827 | 1223 | 1619 |
| 62 | 1613 | 1610 | 1608 | 1605 | 1603 | 1600 | 1597 | 1595 | 1592 | 1590 | 3 | 137 | 461 | 829 | 1229 | 1621 |
| 63 64 | 1587 1563 | 1585 1560 | 1582 1558 | 1580 1555 | 1577 1553 | 1575 1550 | 1572 1548 | 1570 1546 | 1567 1543 | 1565 1541 | 3 | 139 149 | 463 467 | 839 853 | 1231 1237 | $\frac{1627}{1637}$ |
| 65 | 1538 | 1536 | 1534 | 1531 | 1529 | 1527 | 1524 | 1522 | 1520 | 1517 | 2 | 151 | 479 | 857 | 1249 | 1657 |
| 66 | 1515 | 1513 | 1511 | 1508 | 1506 | 1504 | 1502 | 1499 | 1497 | 1495 | 2 | 157 | 487 | 859 | 1259 | 1663 |
| 67 | 1493 1471 | 1490 1468 | 1488 1466 | 1486 1464 | 1484 1462 | 1481 1460 | 1479 1458 | 1477 1456 | 1475 1453 | 1473 1451 | 2 2 | 163 167 | 491 499 | 863 877 | $\frac{1277}{1279}$ | 1667 1669 |
| 69 | 1449 | 1447 | 1445 | 1443 | 1441 | 1439 | 1437 | 1435 | 1433 | 1431 | 2 | 173 | 503 | 881 | 1283 | 1693 |
| 70 | 1429 | 1427 | 1425 | 1422 | 1420 | 1418 | 1416 | 1414 | 1412 | 1410 | 2 | 179 | 509 | 883 | 1289 | 1697 |
| 71 72 | 1408 1389 | 1466 1387 | 1404 1385 | 1403 1383 | 1401 1381 | 1399 1379 | 1397 1377 | 1395 1376 | 1393 1374 | 1391 1372 | 2 2 | 181 191 | 521 523 | 887 907 | 1291 1297 | 1699 |
| 73 | 1370 | 1368 | 1366 | 1364 | 1362 | 1361 | 1359 | 1357 | 1355 | 1353 | 2 | 193 | 541 | 911 | 1301 | $\frac{1709}{1721}$ |
| 74 | 1351 | 1350 | 1348 | 1346 | 1344 | 1342 | 1340 | 1339 | 1337 | 1335 | 2 | 197 | 547 | 919 | 1503 | 1723 |
| 75 | 1333 | 1332 | 1330 | 1328 | 1326 | 1325 | 1323 | 1321 | 1319 | 1318 | 2 | 199 | 557 | 919 | 1307 | 1733 |
| 76 | 1316 1299 | 1314 1297 | 1312 1295 | 1311 1294 | 1309 1292 | 1307 1290 | 1305 1289 | 1304 1287 | 1302 1285 | 1300 1284 | 2 2 | 211 223 | 563 569 | 937 941 | 1319 1321 | 1741 1747 |
| 78 | 1289 | 1280 | 1279 | 1277 | 1276 | 1274 | 1272 | 1271 | 1269 | 1267 | 2 | 227 | 571 | 947 | 1327 | 1753 |
| 79 | 1266 | 1264 | 1263 | 1261 | 1259 | 1258 | 1256 | 1255 | 1253 | 1252 | 2 | 229 | 577 | 953 | 1361 | 1759 |
| 80 | 1250 | 1248 | 1247 | 1245 | 1244 | 1242 | 1241 | 1239 | 1238 | 1236 | 2 | 233 | 587 | 967 | 1367 | 1777 |
| 81 82 | 1235 1220 | 1233 1218 | 1232 1217 | 1230 1215 | 1229 1214 | $1227 \\ 1212$ | 1225 1211 | 1224 1209 | 1222 1208 | 1221 1206 | 2 2 | 239 241 | 593 599 | 971 977 | 1373 1381 | 1783 1787 |
| 83 | 1205 | 1203 | 1202 | 1213 | 1199 | 1198 | 1196 | 1195 | 1193 | 1192 | 1 | 251 | 601 | 983 | 1399 | 1789 |
| 84 | 1190 | 1189 | 1188 | 1186 | 1185 | 1183 | 1182 | 1181 | 1179 | 1178 | 1 | 257 | 607 | 991 | 1409 | 1801 |
| 85 | 1176 | 1175 | 1174 | 1172 | 1171 | 1170 | 1168 | 1167 | 1166 | 1164 | 1 | 263 | 613 | 997 | 1423 | 1811 |
| 86 87 | 1163 1149 | 1161 1148 | 1160 1147 | 1159 1145 | 1157 1144 | 1156 1143 | 1155 1142 | 1153 1140 | 1152 1139 | 1151 1138 | 1 | 269 271 | 617 619 | 1009 1013 | 1427 1429 | 1823 1831 |
| 88 | 1136 | 1135 | 1134 | 1133 | 1131 | 1130 | 1129 | 1127 | 1126 | 1125 | 1 | 277 | 631 | 1019 | 1433 | 1847 |
| 89 | 1124 | 1122 | 1121 | 1120 | 1119 | 1117 | 1116 | 1115 | 1114 | 1112 | 1 | 281 | 641 | 1021 | 1439 | 1861 |
| 90 | 1111 | 1110 | 1109 | 1107 | 1106 | 1105 | 1104 | 1103 | 1101 | 1100 | 1 | 283 | 643 | 1031 | 1447 | 1867 |
| 91 92 | 1099 | 1098 1086 | 1096 1085 | 1095 1083 | 1094 1082 | 1093 1081 | 1092 | 1091 1079 | 1089 1078 | 1088 1076 | 1 | 293 307 | 647 653 | 1033 1039 | $1451 \\ 1453$ | 1871 |
| 93 | 1087 1075 | 1074 | 1073 | 1083 | 1082 | 1070 | 1080 1068 | 1067 | 1078 | 1065 | 1 | 311 | 659 | 1039 | 1459 | 1873 1877 |
| 94 | 1064 | 1063 | 1062 | 1060 | 1059 | 1058 | 1057 | 1056 | 1055 | 1054 | 1 | 313 | 661 | 1051 | 1471 | 1879 |
| 95 | 1053 | 1052 | 1050 | 1049 | 1048 | 1047 | 1046 | 1045 | 1044 | 1043 | 1 | 317 | 673 | 1061 | 1481 | 1889 |
| 96 | 1042 | 1041 | 1040 | 1038 | 1037 | 1036 | 1035 | 1034 | 1033 | 1032 | 1 | 331 | 677 | 1063 | 1483 | 1901 |
| 97 98 | 1031 1020 | 1030 1019 | 1029 1018 | 1028 1017 | 1027 1016 | 1026 1015 | 1025 1014 | 1024 1013 | 1022 1012 | 1021 1011 | 1 | 337 347 | 683 691 | 1069 1087 | 1487 1489 | 1907 1913 |
| 99 | 1010 | 1009 | 1008 | 1007 | 1006 | 1005 | 1004 | 1003 | 1002 | 1001 | 1 | 349 | 701 | 1091 | 1493 | 1931 |
| 100 | 1000 | 9990 | 9980 | 9970 | 9960 | 9950 | 9940 | 9930 | 9921 | 9911 | 10 | 353 | 709 | 1093 | 1499 | 1933 |
| 101 102 | 9901 9804 | 9891 9794 | 9881 9785 | 9872 9775 | 98 62 97 66 | 9852 9756 | 9843 9747 | 98 33 9737 | 9823 9728 | 9814 9718 | 10 10 | 359 367 | $\frac{719}{727}$ | 1097 1103 | 1511 1523 | 1949 1951 |
| 103 | 9804 | 9699 | 9690 | 9681 | 9671 | 9662 | 9653 | 9643 | 9634 | 9625 | 9 | 373 | 733 | 1103 | 1531 | 1951 |
| 104 | 9615 | 9606 | 9597 | 9588 | 9579 | 9569 | 9560 | 9551 | 9542 | 9533 | 9 | 379 | 739 | 1117 | 1543 | 1979 |
| 105 | 9524 | 9515 | 9506 | 9497 | 9488 | 9479 | 9470 | 9461 | 9452 | 9443 | 9 | 383 | 743 | 1123 | 1549 | 1987 |
| 106 | 9434 9346 | 9425 9337 | 9416 9328 | 9407 9320 | 9398 9311 | 9390 9302 | 9381 9294 | 9372 9285 | 9363 9276 | 9355 9268 | 9 | 389 397 | 751 757 | 1129 1151 | 1553 1559 | 1993 1997 |
| 107 108 | 9259 | 9251 | 9242 | 9234 | 9225 | 9217 | 9208 | 9200 | 9191 | 9183 | 9 | 401 | 761 | 1153 | 1567 | 1999 |
| 109 | 9174 | 9166 | 9158 | 9149 | 9141 | 9132 | 9124 | 9116 | 9107 | 9099 | 8 | 409 | 769 | 1163 | 1571 | 2003 |
| 110 | 9091 | 9083 | 9074 | 9066 | 9058 | 9050 | 9042 | 9033 | 9025 | 9017 | 8 | 419 | 773 | 1171 | 1579 | 2011 |
| | | 1 | | | - | 1 | | | | | , | | - | - | | - |

The squares are given to the first four figures, no account being taken of 'place-value.'

| | ır. | | | | | | | | , | | | | | Mea | ın 1 | Diff | erei | ices | | |
|---|----------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|------------------|-----------------------------|-----------------------------|-----------------------------|------------------------|-----------------------------|-----------------------------|-----------------------------|----------------------------|
| | Number. | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| - | 4 | | | | | | | | | | | _ | - | 0 | - | | _ | _ | • | _ |
| | 10 11 12 13 | 1000 1210 1440 1690 1960 | 1020 1232 1464 1716 1988 | 1040 1254 1488 1742 2016 | 1061 1277 1513 1769 2045 | 1082 1300 1538 1796 2074 | 1103 1323 1563 1823 2103 | 1124 1346 1588 1850 2132 | 1145 1369 1613 1877 2161 | 1166 1392 1638 1904 2190 | 1188 1416 1664 1932 2220 | 2 2 3 3 3 | 4 5 5 6 | 6 7 8 8 9 | 9 10 11 12 | 13 14 15 | 14 15 16 17 | 16 18 19 20 | 22 23 | 21 23 24 26 |
| | 16 | 2250 2560 | 2280 2592 | 2624 | 2657 | 2690 | 2723 | 2756 | 2465 2789 | 2822 | 2528 2856 | 3 | | 9 | 13 | 16 17 | 20 | 22 23 | 26 | 30 |
| | 17 18 19 20 | 2890 3240 3610 4000 | 2924 3276 3648 4040 | 2958 3312 3686 4080 | 2993 3349 3725 4121 | 3028 3386 3764 4162 | 3063 3423 3803 4203 | 3098 3460 3842 4244 | 3133 3497 3881 4285 | 3168 3534 3920 4326 | 3204 3572 3960 4368 | 4 4 4 | | 11 11 12 12 | 15 16 | | 22 23 | | | 32 33 35 37 |
| | 21 22 23 24 25 | 4410 4840 5290 5760 6250 | 4452 4884 5336 5808 6300 | 4494 4928 5382 5856 6350 | 4537 4973 5429 5905 6401 | 4580 5018 5476 5954 6452 | 4623 5063 5523 6003 6503 | 4666 5108 5570 6052 6554 | 4709 5153 5617 6101 6605 | 4752 5198 5664 6150 6656 | 4796 5244 5712 6200 6708 | | 9 | | 18 19 20 | 24 | 27 28 29 | 33 34 | 36 38 | 39 41 42 44 46 |
| | 26 27 28 29 30 | 6760 7290 7840 8410 9000 | 6812 7344 7896 8468 9060 | 6864 7398 7952 8526 9120 | 6917 7453 8009 8585 9181 | 6970 7508 8066 8644 9242 | 7023 7563 8123 8703 9303 | 7076 7618 8180 8762 9364 | 7129 7673 8237 8821 9425 | 7182 7728 8294 8880 9486 | 7236 7784 8352 8940 9548 | 6 6 | 11 11 11 12 12 | 17 17 18 | 22 23 24 | 29 | 33 34 35 | 37 39 40 41 43 | 44 46 | 48 50 51 53 55 |
| | 31 31 32 33 34 35 | 9610 1024 1089 1156 1225 | 9672 1030 1096 1163 1232 | 9734 1037 1102 1170 1239 | 9797 1043 1109 1176 1246 | 9860 1050 1116 1183 1253 | 9923 1056 1122 1190 1260 | 9986 1063 1129 1197 1267 | 1005 1069 1136 1204 1274 | 1011 1076 1142 1211 1282 | 1018 1082 1149 1218 1289 | 6 1 1 1 1 1 1 | 13 1 1 1 1 1 | 19 2 2 2 2 2 | 25 3 3 3 3 3 | 32 3 3 3 4 | 38 4 4 4 4 4 | 44 4 5 5 5 5 | 50 5 5 5 6 6 | 56 6 6 6 6 |
| | 36 37 38 39 40 | 1296 1369 1444 1521 1600 | 1303 1376 1452 1529 1608 | 1310 1384 1459 1537 1616 | 1318 1391 1467 1544 1624 | 1325 1399 1475 1552 1632 | 1332 1406 1482 1560 1640 | 1340 1414 1490 1568 1648 | 1347 1421 1498 1576 1656 | 1354 1429 1505 1584 1665 | 1362 1436 1513 1592 1673 | 1 1 1 1 1 | 1 2 2 2 2 2 | 2 2 2 2 2 | 3 3 3 3 | 4 4 4 4 4 | 4 5 5 5 5 | 5 5 5 6 6 | 6 6 6 | 6 7 7 7 |
| 1 | 41 42 43 44 45 | 1681 1764 1849 1936 2025 | 1689 1772 1858 1945 2034 | 1697 1781 1866 1954 2043 | 1706 1789 1875 1962 2052 | 1714 1798 1884 1971 2061 | 1722 1806 1892 1980 2070 | 1731 1815 1901 1989 2079 | 1739 1823 1910 1998 2088 | 1747 1832 1918 2007 2098 | 1756 1840 1927 2016 2107 | 1 1 1 1 | 2 2 2 2 2 2 | 2 3 3 3 3 | 3 3 4 4 | 4 4 4 5 | 5 5 5 5 5 | 6 6 6 6 | 77777 | 7 8 8 8 8 |
| | 46 47 48 49 50 | 2116 2209 2304 2401 2500 | 2125 2218 2314 2411 2510 | 2134 2228 2323 2421 2520 | 2144 2237 2333 2430 2530 | 2153 2247 2343 2440 2540 | 2162 2256 2352 2450 2550 | 2172 2266 2362 2460 2560 | 2181 2275 2372 2470 2570 | 2190 2285 2381 2480 2581 | 2200 2294 2391 2490 2591 | 1 1 1 1 | 2 2 2 2 2 | 3 3 3 | 4 4 4 4 | 5 5 5 5 | 6 6 6 6 | 77777 | 7 8 8 8 | 8 9 9 9 |
| | 51 52 53 54 55 | 2601 2704 2809 2916 3025 | 2611 2714 2820 2927 3036 | 2621 2725 2830 2938 3047 | 2632 2735 2841 2948 3058 | 2642 2746 2852 2959 3069 | 2652 2756 2862 2970 3080 | 2663 2767 2873 2981 3091 | 2673 2777 2884 2992 3102 | 2683 2788 2894 3003 3114 | 2694 2798 2905 3014 3125 | 111111 | 2 2 2 2 2 2 | 3 3 3 3 | 4 4 4 4 | 5 5 5 6 | | 777888 | | 10 |

The squares are given to the first four figures, no account being taken of 'place-value.'

| ber. | 0 | 1 | | | 4 | - | | 7 | | | | 1 | Mea | ın I | Diffe | ere | nces | š. | |
|----------------------------------|---|--|--|--|--|--|--|--|--|--|-----------------------|---------------------------------|-----------------------|-------------------------|---------------------------------|---------------|----------------------|----------------------------|----------------------------|
| Number. | 0 | | 2 | 3 | 4 | 5 | 6 | _ | 8 | 9 | 1 | 2 : | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 55 56 57 58 59 60 | 3025 3136 3249 3364 3481 3600 | 3036 3147 3260 3376 3493 3612 | 3047 3158 3272 3387 3505 3624 | 3058 3170 3283 3399 3516 3636 | 3069 3181 3295 3411 3528 3648 | 3080 3192 3306 3422 3540 3660 | 3091 3204 3318 3434 3552 3672 | 3102 3215 3329 3446 3564 3684 | 3114 3226 3341 3457 3576 3697 | 3125 3238 3352 3469 3588 3709 | 11111111 | 2 2 2 2 2 2 2 | 3 3 4 4 4 | 4 5 5 5 5 5 | 6 6 6 6 6 | 777777 | 888888 | 9 9 9 10 10 | 10 11 11 |
| 61 62 63 64 65 | 3721 3844 3969 4096 4225 | 3733 3856 3982 4109 4238 | 3745 3869 3994 4122 4251 | 3758 3881 4007 4134 4264 | 3770 3894 4020 4147 4277 | 3782 3906 4032 4160 4290 | 3795 3919 4045 4173 4303 | 3807 3931 4058 4186 4316 | 3819° 3944 4070 4199 4330 | 3832 3956 4083 4212 4343 | 1 1 1 1 1 1 | 2 3 3 3 3 | 4 4 4 4 | 5 5 5 5 5 | 6 6 6 7 | 7 8 8 8 8 | 9 9 9 9 | 10 10 10 10 10 | 11 11 |
| 66 67 68 69 70 | 4356 4489 4624 4761 4900 | 4369 4502 4638 4775 4914 | 4382 4516 4651 4789 4928 | 4396 4529 4665 4802 4942 | 4409 4543 4679 4816 4956 | 4422 4556 4692 4830 4970 | 4436 4570 4706 4844 4984 | 4449 4583 4720 4858 4998 | 4462 4597 4733 4872 5013 | 4476 4610 4747 4886 5027 | 1 1 1 1 | 3 3 3 3 3 | 4 4 4 4 | 5 5 6 6 | 7 7 7 7 7 | 88888 | 9 10 10 | 11 11 11 11 11 | 12 12 13 |
| 71 72 73 74 75 | 5041 5184 5329 5476 5625 | 5055 5198 5344 5491 5640 | 5069 5213 5358 5506 5655 | 5084 5227 5373 5520 5670 | 5098 5242 5388 5535 5685 | 5112 5256 5402 5550 5700 | 5127 5271 5417 5565 5715 | 5141 5285 5432 5580 5780 | 5155 5300 5446 5595 5746 | 5170 5314 5461 5610 5761 | 1 1 1 1 2 | 3 3 3 3 | 4 4 4 5 | 6 6 6 6 | 7 7 7 7 8 | 9 9 9 9 | 10 10 | $\frac{12}{12}$ | 13 13 13 13 14 |
| 76 77 78 79 80 | 5776 5929 6084 6241 6400 | 5791 5944 6100 6257 6416 | 5806 5960 6115 6273 6432 | 5822 5975 6131 6288 6448 | 5837 5991 6147 6304 6464 | 5852 6006 6162 6320 6480 | 5868 6022 6178 6336 6496 | 5883 6037 6194 6352 6512 | 5898 6053 6209 6368 6529 | 5914 6068 6225 6384 6545 | 2 2 2 2 | 3 3 3 3 | 5 5 5 5 5 | 6 6 6 6 | 8 1 | 9 9 0 0 | 11 11 | 13 13 | 14 14 14 |
| 81 82 83 84 85 | 6561 6724 6889 7056 7225 | 6577 6740 6906 7073 7242 | 6593 6757 6922 7090 7259 | 6610 6773 6939 7106 7276 | 6626 6790 6956 7123 7293 | 6642 6806 6972 7140 7310 | 6659 6823 6989 7157 7327 | 6675 6839 7006 7174 7344 | 6691 6856 7022 7191 7362 | 6708 6872 7039 7208 7379 | 2 2 2 2 | 3 | 5 5 5 5 5 | 77777 | 8 1 8 1 8 1 8 1 9 1 | 0 0 0 | 12 | 13 13 14 | 15 15 15 |
| 86 87 88 89 90 | 7396 7569 7744 7921 8100 | 7413 7586 7762 7939 8118 | 7430 7604 7779 7957 8136 | 7448 7621 7797 7974 8154 | 7465 7639 7815 7992 8172 | 7482 7656 7832 8010 8190 | 7500 7674 7850 8028 8208 | 7517 7691 7868 8046 8226 | 7534 7709 7885 8064 8245 | 7552 7726 7903 8082 8263 | 2 2 2 2 2 | 4 4 4 | 5 5 5 5 5 | 7 7 7 7 7 | 9 1 9 1 9 1 9 1 9 1 | 1 1 1 | 12 12 | 14 | 16 16 16 |
| 91 92 93 94 95 | 8281 8464 8649 8836 9 0 25 | 8299 8482 8668 8855 9044 | 8317 8501 8686 8874 9063 | 8336 8519 8705 8892 9082 | 8354 8538 8724 8911 9101 | 8372 8556 8742 8930 9120 | 8391 8575 8761 8949 9139 | 8409 8593 8780 8968 9158 | 8427 8612 8798 8987 9178 | 8446 8630 8817 9006 9197 | 2 2 2 2 2 | 4 4 | 5 6 6 6 6 | 7 7 7 8 8 1 | 9 1 9 1 9 1 9 1 0 1 | 1 1 1 | 13 13 | 15 15 15 | 16 17 17 17 17 |
| 96 97 98 99 | 9216 9409 9604 9801 | 9235 9428 9624 9821 | 9254 9448 9643 9841 | 9274 9467 9663 9860 | 9293 9487 9683 9880 | 9312 9506 9702 9900 | 9332 9526 9722 9920 | 9351 9545 9742 9940 | 9370 9565 9761 9960 | 9390 9584 9781 9980 | 2 2 2 2 | 4 | 6 6 6 | 8 1 8 1 | .0 1 .0 1 .0 1 | $\frac{2}{2}$ | 14 14 14 14 | 16 16 | 17 18 18 18 |

The cubes are given to the first four figures, no account being taken of 'place-value.'

| per. | 0 1 | | | | | _ | 6 | 7 | | 0 | | | Me | an l | Diff | erei | nces | 5. | |
|----------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-----|----------|----------|----------|----------|----------|----------|------------------|----------|
| Number. | 0 | 1 | 2 | 3 | 4 | 5 | | _ | 8 | 9 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 10 | 1000 1331 | 1030 1368 | 1061 1405 | 1093 1443 | 1125 1482 | 1158 1521 | 1191 1561 | 1225 1602 | 1260 1643 | 1295 1685 | 3 4 | 7 8 | 10 12 | 13 16 | 17 20 | 20 24 | 23 28 | 26 32 | 30 36 |
| 12 | 1728 | 1772 | 1816 | 1861 | 1907 | 1953 | 2000 | 2048 | 2097 | 2147 | 5 | 9 | 14 | 19 | 23 | 28 | 33 | 38 | 42 |
| 13 | 2197 | 2248 | 2300 | 2353 | 2406 | 2460 | 2515 | 2571 | 2628 | 2686 | 5 | 11 | 16 | 22 | 27 | 33 | 38 | 44 | 49 |
| 15 | 2744 3375 | 2803 3443 | 2863 3512 | 2924 3582 | 2986 3652 | 3049 3724 | 3112 3796 | 3177 3870 | 3242 3944 | 3308 4020 | 6 7 | 13 14 | 19 22 | 25 29 | 32 36 | 38 43 | 44 50 | 50 58 | 57 65 |
| 16 | 4096 | 4173 | 4252 | 4331 | 4411 | 4492 | 4574 | 4657 | 4742 | 4827 | 8 | 16 | 25 | 33 | | 49 | 57 | 65 | 74 |
| 17 | 4913 5832 | 5000 5930 | 5088 6029 | 5178 6128 | 5268 6230 | 5359 6332 | 5452 6435 | 5545 6539 | 5640 6645 | 5735 6751 | 9 | 18 20 | 28 31 | 37 41 | 46 52 | 55 62 | 64 72 | 74 82 | 83 93 |
| 19 | 6859 | 6968 | 7078 | 7189 | 7301 | 7415 | 7530 | 7645 | 7762 | 7881 | 11 | | 34 | | 57 | 68 | 80 | 91 | 103 |
| 20 | 8000 | 8121 | 8242 | 8365 | 8490 | 8615 | 8742 | 8870 | 8999 | 9129 | 13 | 25 | 38 | 50 | 63 | 76 | 88 | 101 | 113 |
| 21 | 9261 | 9394 | 9528 | 9664 | 9800 | 9938 | 1008 | 1022 | 1036 | 1050 | 14 | 27 3 | 41 5 | 54 6 | 68 7 | 82 | 95 10 | 109 12 | 129 |
| 22 | 1065 | 1079 | 1094 | 1109 | 1124 | 1139 | 1154 | 1170 | 1185 | 1201 | 2 | 3 | 5 | 6 | 8 | 9 | 11 | 12 | 14 |
| 23 | 1217 | 1233 | 1219 | 1265 | 1281 | 1293 | 1314 | 1331 | 1348 | 1365 | 2 | 3 | 5 | 7 | 8 | 10 | 12 | 13 | 14 |
| 24 25 | 1382 1563 | 1400 1581 | 1417 1600 | 1435 1619 | 1453 1639 | 1471 1658 | 1489 1678 | 1507 1697 | 1525 1717 | 1544 1737 | 2 2 | 4 | 5 | 8 | 9 | 11 12 | 13 14 | 14 16 | 10 |
| 26 | 1758 | 1778 | 1798 | 1819 | 1840 | 1861 | 1882 | 1903 | 1925 | 1947 | 2 | 4 | 6 | | 11 | 13 | 15 | 17 | 19 |
| 27 | 1968 | 1990 | 2012 2243 | 2035 2267 | 2057 | 2080 2315 | 2102 2339 | 2125 | 2148 | 2172 2414 | 2 2 | 5 | 7 | 9 | | 14 | 16 17 | 18 | 20 |
| 28 29 | 2195 2439 | 2219 2464 | 2490 | 2515 | 2291 2541 | 2567 | 2593 | 2364 2620 | 2389 2646 | 2673 | 3 | 5 | 8 | | 12 13 | 15 16 | 18 | 20 21 | 2 |
| 30 | 2700 | 2727 | 2754 | 2782 | 2809 | 2837 | 2865 | 2893 | 2922 | 2950 | 3 | 6 | 8 | 11 | 14 | 17 | 20 | 22 | 2 |
| 31 32 | 2979 3277 | 3008 3308 | 3037 3339 | 3066 3370 | 3096 3401 | 3126 3433 | 3155 3465 | 3186 3497 | 3216 3529 | 3246 3561 | 3 | 6 | 9 | 12 13 | 15 16 | 18 19 | 21 22 | 24 25 | 25 |
| 33 | 3594 | 3626 | 3659 | 3693 | 3726 | 3760 | 3793 | 3827 | 3861 | 3896 | 3 | 7 | 10 | 13 | 17 | 20 | 24 | 27 | 3 |
| 34 | 3930 | 3965 4324 | 4000 | 4035 | 4071 | 4106 | 4142 4512 | 4178 4550 | 4214 4588 | 4251 4627 | 4 4 | 7 8 | 11 11 | 14 15 | 18 19 | 21 23 | 25 26 | 29 30 | 3: |
| 35 | 4288 | | 4361 | | 4436 | | 4012 | 4000 | | 4027 | 4 | 3 | 11 | 19 | 19 | | | | |
| 36 | 4666 | 4705 | 4744 | 4783 | 4823 | 4863 | 4903 | 4943 | 4984 | 5024 | 4 | | | 16 | 20 | 24 25 | 28 | 32 | 3 |
| 37 38 | 5065 5487 | 5106 5531 | 5148 5574 | 5190 5618 | 5231 5662 | 5273 5707 | 5316 5751 | 5358 5796 | 5401 5841 | 5444 5886 | 4 | 8 | 13 13 | 17 18 | 21 22 | 27 | 30 31 | 34 36 | 3 |
| 39 | 5932 | 5978 | 6024 | 6070 | 6116 | 6163 | 6210 | 6257 | 6304 | 6352 | 5 | 9 | 14 | 19 | 23 | 28 | 33 | 37 | 4 |
| 40 | 6400 | 6448 | 6496 | 6545 | 6594 | 6643 | 6692 | 6742 | 6792 | 6842 | 5 | 10 | 15 | 20 | 25 | 30 | 34 | 39 | 4 |
| 41 | 6892 | 6943 | 6993 | 7044 | 7096 | 7147 | 7199 | 7251 | 7303 | 7356 | | 10 | | 21 | | 31 | 36 | 41 | 4 |
| 42 43 | 7409 7951 | 7462 8006 | 7515 8062 | 7569 8118 | 7623 S175 | 7677 8231 | 7731 8288 | 7785 8345 | 7840 8403 | 7895 8460 | 5 6 | 11 | 16 17 | 22 23 | 27 28 | 33 34 | 38 | 43 45 | 5 |
| 44 | 8518 | 8577 | 8635 | 8694 | 8753 | 8812 | 8872 | 8931 | 8992 | 9052 | | 12 | 18 | 24 | 30 | 36 | 42 | | 5 |
| 45 | 9113 | 9173 | 9235 | 9296 | 9358 | 9420 | 9482 | 9544 | 9607 | 9670 | 6 | | | 25 | | 37 | 43 | 50 | |
| 46 | 9734 | 9797 | 9861 | 9925 | 9990 | 1005 | 1010 | 1010 | 1025 | 1032 | 6 | 13 1 | 19 2 | 26 | 32 | 38 | 45 | 51 5 | 5 |
| 46 47 | 1038 | 1045 | 1052 | 1058 | 1065 | 1005 | 1012 1079 | 1018 1085 | 1025 | 1032 | 1 | 1 | 2 | 3 | 3 | 4 | 5 | 5 | |
| 48 | 1106 | 1113 | 1120 | 1127 | 1134 | 1141 | 1148 | 1155 | 1162 | 1169 | 1 | 1 | 2 | 3 3 | 4 | 4 | 5 | 6 | |
| 49 50 | 1176 1250 | 1184 1258 | 1191 1265 | 1198 1273 | 1206 1280 | 1213 1288 | 1220 1296 | 1228 1303 | 1235 1311 | 1243 1319 | 1 1 | 1 2 | 2 2 | 3 | 4 | 5 | 5 5 | 6 | |
| 51 | 1327 | 1334 | 1342 | 1350 | 1358 | 1366 | 1374 | 1382 | 1390 | 1398 | 1 | 2 | 2 | 3 | 4 | 5 | 6 | 6 | |
| 52 | 1406 | 1414 | 1422 | 1431 | 1439 | 1447 | 1455 | 1464 | 1472 | 1480 | 1 | 2 2 | 2 | 3 | 4 | 5 | 6 | 7 | |
| 53 54 | 1489 1575 | 1497 1583 | 1506 1592 | 1514 1601 | 1523 1610 | 1531 1619 | 1540 1628 | 1549 1637 | 1557 1646 | 1566 1655 | 1 1 | 2 | 3 | 3 4 | 4 | 5 | 6 | 6 7 7 7 | |
| 55 | 1664 | 1673 | 1682 | 1691 | 1700 | 1710 | 1719 | 1728 | 1737 | 1747 | li | 2 | 3 | 4 | 5 | 6 | 6 | 7 | |

The cubes are given to the first four figures, no account being taken of 'place-value.'

| ber. | upper. | | | | | | | | | | T | | Me | ean | Dif | fere | nce | s. | |
|----------------------------------|---------------------------------------|--------------------------------------|--|--|--|--|--|--|--|--|-----------------------|---------------------------------|------------------|-----------------------|----------------------------|----------------------------|---------------------------------|----------------------------------|----------------------------|
| Number. | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 55 56 57 58 59 60 | 1756 1852 1951 2054 | 1766 1862 1961 2064 | 1682 1775 1871 1971 2075 2182 | 1691 1785 1881 1982 2085 2193 | 1700 1794 1891 1992 2096 2203 | 1710 1804 1901 2002 2106 2214 | 1719 1813 1911 2012 2117 2225 | 1728 1823 1921 2023 2128 2236 | 1737 1833 1931 2033 2138 2248 | 1747 1842 1941 2043 2149 2259 | 1 1 1 1 1 1 1 | 2 2 2 2 2 2 2 | 3 3 3 3 3 3 | 4 4 4 4 4 4 | 5 5 5 5 6 | 6 6 6 6 7 | 6 7 7 7 7 7 8 | 7 8 8 8 8 9 | 9 9 9 |
| 61 62 63 64 65 | 2621 | 2281 2395 2512 2634 2759 | 2292 2406 2524 2646 2772 | 2303 2418 2536 2658 2784 | 2315 2430 2548 2671 2797 | 2326 2441 2560 2683 2810 | 2337 2453 2573 2696 2823 | 2349 2465 2585 2708 2836 | 2360 2477 2597 2721 2849 | 2372 2489 2609 2734 2862 | 1 1 1 1 1 | 2 2 2 3 3 | 4 4 4 4 | 5 5 5 5 5 | 6 6 6 6 | 7 7 8 8 | 8 8 8 9 | 9 10 | 11 11 |
| 66 67 68 69 70 | 2875 3008 3144 3285 3430 | 2888 3021 3158 3299 3445 | 2901 3035 3172 3314 3459 | 2914 3048 3186 3328 3474 | 2928 3062 3200 3343 3489 | 2941 3075 3214 3357 3504 | 2954 3089 3228 3372 3519 | 2967 3103 3242 3386 3534 | 2981 3117 3257 3401 3549 | 2994 3130 3271 3415 3564 | 1 1 1 1 | 3 3 3 3 | 4 4 4 4 | 5 5 6 6 6 | 77777 | 8 8 8 9 9 | 10 10 10 | 11 11 11 12 12 | 12 12 13 13 13 |
| 71 72 73 74 75 | 3579 3732 3890 4052 4219 | 3594 3748 3906 4069 4236 | 3609 3764 3922 4085 4253 | 3625 3779 3938 4102 4270 | 3640 3795 3954 4118 4287 | 3655 3811 3971 4135 4304 | 3671 3827 3987 4152 4321 | 3686 3842 4003 4168 4338 | 3701 3858 4019 4185 4355 | 3717 3874 4036 4202 4372 | 2 2 2 2 2 | 3 3 3 3 | 5 5 5 5 | 6 6 6 7 7 | 7 8 8 8 9 | 9 9 10 10 | 11 11 12 | 12 13 13 13 14 | 14 14 15 15 15 |
| 76 77 78 79 80 | 4390 4565 4746 4930 5120 | 4407 4583 4764 4949 5139 | 4425 4601 4782 4968 5158 | 4442 4619 4800 4987 5178 | 4459 4637 4819 5006 5197 | 4477 4655 4837 5025 5217 | 4495 4673 4856 5044 5236 | 4512 4691 4874 5063 5256 | 4530 4709 4893 5082 5275 | 4548 4727 4912 5101 5295 | 2 2 2 2 2 | 4 4 4 4 | 5 6 6 6 | 7 7 7 8 8 | 9 | 11 11 11 11 11 | 13 13 | 14 14 15 15 16 | 16 17 17 |
| 81 82 83 84 85 | 5314 5514 5718 5927 6141 | 5334 5534 5739 5948 6163 | 5354 5554 5759 5969 6185 | 5374 5574 5780 5991 6207 | 5394 5595 5801 6012 6228 | 5413 5615 5822 6034 6250 | 5433 5636 5843 6055 6272 | 5453 5656 5864 6076 6294 | 5473 5677 5885 6098 6316 | 5494 5697 5906 6120 6338 | 2 2 2 2 2 | 4 4 4 4 | 6 6 6 7 | 8 8 9 | 10 10 10 11 11 | 12 13 13 | 14 15 15 | 16 16 17 17 18 | 18 19 19 |
| 86 87 88 89 90 | 6361 6585 6815 7050 -7290 | 6383 6608 6838 7073 7314 | 6405 6631 6861 7097 7339 | 6427 6653 6885 7121 7363 | 6450 6676 6908 7145 7388 | 6472 6699 6932 7169 7412 | 6495 6722 6955 7193 7437 | 6517 6745 6979 7217 7461 | 6540 6768 7002 7242 7486 | 6562 6792 7026 7266 7511 | 2 2 2 2 2 | 5 5 5 5 | 77777 | 9 9 10 | 12 | 14 14 14 | 16 16 17 | | 21 21 22 |
| 91 92 93 94 95 | 7536 7787 8044 8306 8574 | 7561 7812 8070 8332 8601 | 7586 7838 8096 8359 8628 | 7610 7863 8122 8386 8655 | 7636 7889 8148 8412 8683 | 7661 7915 8174 8439 8710 | 7686 7940 8200 8466 8737 | 7711 7966 8227 8493 8765 | 7736 7992 8253 8520 8792 | 7762 8018 8279 8547 8820 | 3 3 3 3 3 | 5 5 5 5 | 8 8 8 8 8 | 10 10 11 | 13 13 | 15 15 16 16 16 | 18 18 19 | 20 21 21 21 21 22 | 23 23 24 24 25 |
| 96 97 98 99 | 8847 9127 9412 9703 | 8875 9155 9441 9732 | 8903 9183 9470 9762 | 8931 9212 9499 9791 | 8958 9240 9528 9821 | 8986 9269 9557 9851 | 9014 9297 9586 9880 | 9042 9326 9615 9910 | 9070 9354 9644 9940 | 9099 9383 9674 9970 | 3 3 3 3 | 6 6 6 | 8 9 9 | 11 | 15 | 17 17 | 20 20 20 21 | 23 23 | 25 26 26 27 |

COMPOUND INTEREST TABLE,

Showing 'Amount' of £1, after from 1 to 50 years (or other equal periods), at

| Year or Period. | 1%. | 1.5 %. | 2 % | 2·5 °/. | 3 % | 3.5 % | 4 % | 4.5 °/. | 5 °/. |
|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|------------------|
| 1 | 1.01000 | 1.01500 | 1.02000 | 1.02500 | 1.03000 | 1.03500 | 1.04000 | 1.04500 | 1.0500 |
| 2 | 1.02010 | 1.03023 | 1.04040 | 1.05063 | 1.06090 | 1.07123 | 1.08160 | 1.09203 | 1.1025 |
| 4 | 1.03030 1.04060 | 1.04568 1.06136 | 1.06121 | 1.07689 | 1.09273 | 1·10872 1·14752 | 1·12486 1·16986 | 1·14117 1·19252 | 1.1576 |
| 5 | 1.05101 | 1.07728 | 1.10408 | 1.13141 | 1.15927 | 1.18769 | 1.21665 | 1.24618 | 1.2762 |
| 6 | 1.06152 | 1.09344 | 1.12616 | 1.15969 | 1 19405 | 1.22926 | 1.26532 | 1.30226 | 1.3401 |
| 8 | 1.07214 | 1·10984 1·12649 | 1.14869 | 1.18869 | 1.22987 | 1.27228 | 1.31593 | 1.36086 | 1.4071 |
| 9 | 1.08286 1.09369 | 1.14339 | 1.19509 | 1.21840 1.24886 | 1.26677 1.30477 | 1·31681 1·36290 | 1·36857 1·42331 | 1.42210 1.48610 | 1.4774 |
| 10 | 1.10462 | 1.16054 | 1.21899 | 1.58008 | 1.34392 | 1.41060 | 1.48024 | 1.55297 | 1.6288 |
| 11 | 1.11567 | 1.17795 | 1.24337 | 1.31209 | 1.38423 | 1.45997 | 1.53945 | 1.62285 | 1.7103 |
| 12 | 1.12683 | 1.19562 | 1.26824 | 1.34489 | 1.42576 | 1.51107 | 1.60103 | 1.69588 | 1.7958 |
| 13 14 | 1·13809 1·14947 | 1·21355 1·23176 | 1.31948 | 1.37851 | 1.46853 1.51259 | 1.56396 1.61869 | 1.66507 1.73168 | 1.77220 1.85194 | 1.8856 |
| 15 | 1.16097 | 1.25023 | 1.34587 | 1.44830 | 1.55797 | 1.67535 | 1.80094 | 1.93528 | 2.0789 |
| 16 | 1.17258 | 1.26899 | 1.37279 | 1.48451 | 1.60471 | 1.73399 | 1.87298 | 2.02237 | 2.1828 |
| 17 | 1.18430 | 1.28802 | 1.40024 | 1.52162 | 1.65285 | 1.79468 | 1.94790 | 2.11338 | 2.2920 |
| 18 19 | 1·19615 1·20811 | 1.30734 1.32695 | 1.42825 1.45681 | 1.55966 1.59865 | 1.70243 1.75351 | 1.85749 1.92250 | 2·02582 2·10685 | 2.20848 | 2.4066 |
| 20 | 1.22019 | 1.34686 | 1.48595 | 1.63862 | 1.80611 | 1.98979 | 2.19112 | 2.41171 | 2.6533 |
| 21 | 1.23239 | 1.36706 | 1.51567 | 1.67958 | 1.86029 | 2.05943 | 2.27877 | 2.52024 | 2.7859 |
| 22 | 1.24472 | 1.38756 | 1.54598 | 1.72157 1.76461 | 1.91610 | 2.13151 | 2.36992 | 2.63365 | 2.9252 |
| 23 24 | 1·25716 1·26973 | 1.40838 1.42950 | 1.57690 1.60844 | 1.80873 | 1.97359 2.03279 | 2·20611 2·28333 | 2·46472 2·56330 | 2.75217 | 3·0713 3·2251 |
| 25 | 1.28243 | 1.45095 | 1.64061 | 1.85394 | 2.09378 | 2.36324 | 2.66584 | 3.00543 | 3.3868 |
| 26 | 1.29526 | 1.47271 | 1.67342 | 1.90029 | 2.15659 | 2.44596 | 2.77247 | 3.14068 | 3.5556 |
| 27 | 1.30821 | 1.49480 | 1.70689 | 1.94780 | 2.22129 | 2.53157 | 2.88337 | 3.28201 | 3.7334 |
| 28 29 | 1·32129 1·33450 | 1·51722 1·53998 | 1.74102 1.77584 | 1.99650 2.04641 | 2·28793 2·35657 | 2.62017 2.71188 | 2·99870 3·11865 | 3·42970 3·58404 | 3·9201 4·1161 |
| 30 | 1.34785 | 1.56308 | 1.81136 | 2.09757 | 2.42726 | 2.80679 | 3.24340 | 3.74532 | 4.3219 |
| 31 | 1.36133 | 1.58653 | 1.84759 | 2.15001 | 2.50008 | 2.90503 | 3.37313 | 3.91386 | 4.5380 |
| 32 | 1.37494 | 1.61032 | 1.88454 | 2.20376 | 2.57508 | 3.00671 | 3.50806 | 4.08998 | 4.7649 |
| 33 34 | 1·38869 1·40258 | 1.63448 1.65900 | 1.92223 1.96068 | 2·25885 2·31532 | 2.65234 2.73191 | 3·11194 3·22086 | 3.64838 3.79432 | 4·27403 4·46636 | 5.0031 5.2533 |
| 35 | 1.41660 | 1.68388 | 1.99989 | 2.37321 | 2.81386 | 3.33359 | 3.94609 | 4.66735 | 5.236 |
| 36 | 1.43077 | 1.70914 | 2.03989 | 2.43254 | 2.89828 | 3.45027 | 4.10393 | 4.87738 | 5.7918 |
| 37 | 1.44508 | 1.73478 | 2.08069 | 2.49335 | 2.98523 | 3.57103 | 4.26809 | 5.09686 | 6:0814 |
| 38 39 | 1.45953 1.47412 | 1.76080 1.78721 | 2·12230 2·16474 | 2.55568 2.61957 | 3·07478 3·16703 | 3.69601 3.82537 | 4.43881 | 5·32622 5·56590 | 6.3584 |
| 40 | 1.48886 | 1.81402 | 2.20804 | 2.68506 | 3.26204 | 3.95926 | 4.80102 | 5.81636 | 7.0399 |
| 41 | 1.50375 | 1.84123 | 2.25220 | 2.75219 | 3*35990 | 4.09783 | 4.99306 | 6.07810 | 7:3919 |
| 42 | 1.51879 | 1.86885 | 2.29724 | 2.82100 | 3.46070 | 4.24126 | 5.19278 | 6.35162 | 7.7615 |
| 43 44 | 1.53398 1.54932 | 1.89688 1.92533 | 2·34319 2·39005 | 2·89152 2·96381 | 3.56452 3.67145 | 4·38970 4·54334 | 5.40050 5.61652 | 6.63744 | 8·1496 8·5571 |
| 45 | 1.56481 | 1.95421 | 2.43785 | 3.03790 | 3.78160 | 4.70236 | 5.84118 | 7.24825 | 8.9850 |
| 46 | 1.58046 | 1.98353 | 2.48661 | 3.11385 | 3.89504 | 4.86694 | 6.07482 | 7.57442 | 9.4342 |
| 47 | 1.59626 | 2.01328 | 2.53634 | 3.19170 | 4.01190 | 5·03728 5·21359 | 6.31782 | 7.91527 8.27146 | 9.9059 |
| 48 49 | 1.61223 1.62835 | 2.04348 2.07413 | 2.58707 2.63881 | 3·27149 3·35328 | 4·13225 4·25622 | 5.39606 | 6.83335 | 8.64367 | 10.4012 |
| 50 | 1.64463 | 2.10524 | 2.69159 | 3.43711 | 4.38391 | 5.58493 | 7.10668 | 9.03264 | 11.467 |

Present Value of £1 due 1 to 50 years (or other equal periods) hence, at

| 1 %. | 1.5 % | 2 °/。 | 2.5 °/. | 3 °/. | 3.5 % | 4 °/. | 4.5 % | 5 °/. |
|----------------|--|--|---------|--------|--------|--------|--------|--------|
| *99010 | *98522 | *98039 | *97561 | *97087 | *96618 | *96154 | *95694 | 95238 |
| *98030 | *97066 | *96117 | *95181 | *94260 | *93351 | *92456 | *91573 | •90703 |
| *97059 | *95632 | *94232 | *92860 | *91514 | *90194 | *88900 | *87630 | •86384 |
| *96098 | *94218 | *92385 | *90595 | *88849 | *87144 | *85480 | *83856 | •82270 |
| *95147 | *92826 | *90573 | *88385 | *86261 | *84197 | *82193 | *80245 | •78353 |
| *94205 | *91454 | *88797 | *86230 | *83748 | *81350 | *79031 | *76790 | *74622 |
| *93272 | *90103 | *87056 | *84127 | *81309 | *78599 | *75992 | *73483 | *71068 |
| *92348 | *88771 | *85349 | *82075 | *78941 | *75941 | *73069 | *70319 | *67684 |
| *91434 | *87459 | *83676 | *80073 | *76642 | *73373 | *70259 | *67290 | *64461 |
| *90529 | *86167 | *82035 | *78120 | *74409 | *70892 | *67556 | *64393 | *61391 |
| *89632 | *84893 | *80426 | *76214 | *72242 | *68495 | *64958 | *61620 | *58468 |
| *88745 | *83639 | *78849 | *74356 | *70138 | *66178 | *62460 | *58966 | *55684 |
| *878 66 | *82403 | *77303 | *72542 | *68095 | *63940 | *60057 | *56427 | *53032 |
| *86996 | *81185 | *75788 | *70773 | *66112 | *61778 | *57748 | *53997 | *50507 |
| *86135 | *79985 | *74301 | *69047 | *64186 | *59689 | *55526 | *51672 | *48102 |
| *85282 | *78803 | *72845 | *67363 | *62317 | *57671 | *53391 | *49447 | *45811 |
| *84438 | *77639 | *71416 | *65720 | *60502 | *55720 | *51337 | *47318 | *43630 |
| *83602 | *76491 | *70016 | *64117 | *58739 | *53836 | *49363 | *45280 | *41552 |
| *82774 | *75361 | *68643 | *62553 | *57029 | *52016 | *47464 | *43330 | *39573 |
| *81954 | *74247 | *67297 | *61027 | *55368 | *50257 | *45639 | *41464 | *37689 |
| -81143 | *73150 | *65978 | *59539 | *53755 | *48557 | *43883 | *39679 | *35894 |
| ·80340 | *72069 | *64684 | *58086 | *52189 | *46915 | *42196 | *37970 | *34185 |
| ·79544 | *71004 | *63416 | *56670 | *50669 | *45329 | *40573 | *36335 | *32557 |
| ·78757 | *69954 | *62172 | *55288 | *49193 | *43796 | *39012 | *34770 | *31007 |
| ·77977 | *68921 | *60953 | *53939 | *47761 | *42315 | *37512 | *33273 | *29530 |
| •77205 | *67902 | *59758 | *52623 | *46369 | *40884 | *36069 | *31840 | *28124 |
| •76440 | *66899 | *58586 | *51340 | *45019 | *39501 | *34682 | *30469 | *26785 |
| •75684 | *65910 | *57437 | *50088 | *43708 | *38165 | *33348 | *29157 | *25509 |
| •74934 | *64936 | *56311 | *48866 | *42435 | *36875 | *32065 | *27902 | *24295 |
| •74192 | *63976 | *55207 | *47674 | *41199 | *35628 | *30832 | *26700 | *23138 |
| *73458 | *63031 | *54125 | *46511 | *39999 | *34423 | *29646 | *25550 | *22036 |
| *72730 | *62099 | *53063 | *45377 | *38834 | *33259 | *28506 | *24450 | *20987 |
| *72010 | *61182 | *52023 | *44270 | *37703 | *32134 | *27409 | *23397 | *19987 |
| *71297 | *60277 | *51003 | *43191 | *36604 | *31048 | *26355 | *22390 | *19035 |
| *70591 | *59387 | *50003 | *42137 | *35538 | *29998 | *25342 | *21425 | *18129 |
| *69892 | *58509 | '49022 | *41109 | *34503 | *28983 | *24367 | *20503 | ·17266 |
| *69200 | *57644 | '48061 | *40107 | *33498 | *28003 | *23430 | *19620 | ·16444 |
| -68515 | *56792 | '47119 | *39128 | *32523 | *27056 | *22529 | *18775 | ·15661 |
| *67837 | *55953 | '46195 | *38174 | *31575 | *26141 | *21662 | *17967 | ·14915 |
| *67165 | *55126 | '45289 | *37243 | *30656 | *25257 | *20829 | *17193 | ·14205 |
| *66500 | *54312 | *44401 | *36335 | *29763 | *24403 | *20028 | ·16453 | *13528 |
| *65842 | *53509 | *43530 | *35448 | *28896 | *23578 | *19257 | ·15744 | *12884 |
| *65190 | *52718 | *42677 | *34584 | *28054 | *22781 | *18517 | ·15066 | *12270 |
| *64545 | *51939 | *41840 | *33740 | *27237 | *22010 | *17805 | ·14417 | *11686 |
| *63906 | *51171 | *41020 | *32917 | *26444 | *21266 | *17120 | ·13796 | *11130 |
| *63273 | *50415 | *40215 | *32115 | *25674 | *20547 | 16461 | 13202 | *10600 |
| *62646 | *49670 | *39427 | *31331 | *24926 | *19852 | 15828 | 12634 | *10095 |
| *62026 | *48936 | *38654 | *30567 | *24200 | *19181 | 15219 | 12090 | *09614 |
| *61412 | *48213 | *37896 | *29822 | *23495 | *18532 | 14634 | 11569 | *09156 |
| *60804 | *47500 | *37153 | *29094 | *22811 | *17905 | 14071 | 11071 | *08720 |
| | 99010 98030 97059 96098 95147 94205 93272 92348 931434 90529 88736 86996 86135 85282 84438 83602 8273 77977 77205 77405 776440 775684 74934 74192 73458 72780 72010 72010 72010 735646 66506 665515 665906 66542 665190 66546 66206 663273 62646 66206 | 99010 98522 98030 97066 97069 95632 96098 94218 95147 92828 94205 91454 93272 90103 92348 88771 91434 87459 90529 86167 89632 84893 88745 83639 8745 82639 87468 82403 86996 81185 86135 779985 85282 78803 84438 77639 83602 76491 82774 75361 81934 74247 81143 73150 896340 72069 79544 71004 77977 68921 77205 67902 76440 688910 74934 64936 74192 63976 73458 63031 72730 62099 72010 61182 771297 60277 70591 59387 69892 58509 69900 57644 68515 56792 770591 59387 69892 58509 69900 57644 68515 56792 67837 55953 67165 55126 66500 55412 66560 55412 66560 55171 663273 50415 662646 49670 662026 48936 | Page | Page | Page | Page | Page | |

40 EXPONENTIALS & HYPERBOLIC FUNCTIONS.

| x | e ^x | e-x | cosh x | sinh'x | tanh x | log cosh x | log sinh a |
|------------|----------------|----------------|------------------|--------|--------|------------|------------|
| ·1 | 1.1052 | 9048 | 1.0050 | 1002 | -0997 | 0.0022 | 1.0007 |
| .2 | 1.2214 | *8187 | 1.0201 | 2013 | 1974 | .0086 | 11:3039 |
| .3 | 1.3499 | .7408 | 1.0453 | 3045 | 2913 | .0193 | 11.4836 |
| •4 | 1.4918 | 6703 | 1.0811 | *4108 | 3799 | •0339 | 11.6136 |
| -5 | | *6065 | 1.1276 | •5211 | | 0522 | |
| | 1.6487 | 0005 | 1 12/0 | 5211 | '4621 | 0522 | 11.7169 |
| 6 | 1.8221 | *5488 | 1.1855 | *6367 | .5370 | .0739 | ".8039 |
| .7 | 2.0138 | *4966 | 1.2552 | *7586 | *6044 | *0987 | 11.8800 |
| -8 | 2.2255 | *4493 | 1.3374 | *8881 | *6640 | 1263 | 11*9485 |
| .9 | 2.4596 | •4066 | 1.4331 | 1.0265 | 7163 | ·1563 | 0.0114 |
| 1.0 | 2.7183 | 3679 | 1.5431 | 1.1752 | 7616 | ·1884 | 0.0701 |
| 1.1 | 3.0042 | *3329 | 1.6685 | 1.3357 | *8005 | *2223 | 0.1257 |
| 1.2 | 3.3201 | *3012 | 1.8107 | 1.5095 | *8337 | 2578 | 0.1788 |
| 1.3 | 3.6693 | •2725 | 1.9709 | 1.6984 | 8617 | 2947 | 0.5300 |
| 1.4 | 4.0552 | 2466 | 2.1509 | 1.9043 | *8854 | 3326 | 0.2797 |
| 1.5 | 4.4817 | •2231 | 2.3524 | 2.1293 | 9051 | 3715 | 0.3282 |
| 1.6 | 4.0500 | .0010 | 0.5775 | 0.0000 | .0047 | | |
| 1.7 | 4.9530 | ·2019 ·1827 | 2·5775 2·8283 | 2:3756 | 9217 | 4112 | 0.3758 |
| 1.7 | 5.4739 | | | 2.6456 | •9354 | •4515 | 0.4225 |
| 1.8 | 6.0496 | ·1653 | 3.1075 | 2.9422 | 9468 | *4924 | 0.4687 |
| 1.9 | 6.6859 | ·1496 | 3.4177 | 3.2682 | 9563 | .5337 | 0.5143 |
| 2.0 | 7.3891 | •1353 | 3.7622 | 3.6269 | .9640 | *5754 | 0.5595 |
| 2.1 | 8.1662 | 1225 | 4.1443 | 4.0219 | 9704 | ·6175 | 0.6044 |
| 2.2 | 9.0251 | .1108 | 4.5679 | 4.4571 | 9758 | .6597 | 0.6491 |
| 2.3 | 9.9742 | •1003 | 5.0372 | 4.9370 | 9801 | .7022 | 0.6935 |
| 2.4 | 11.0232 | .0907 | 5.5570 | 5.4662 | 9837 | .7448 | O.POPP |
| 2.5 | | | | | | | . 0.7377 |
| 2.9 | 12.1825 | *0821 | 6.1323 | 6.0502 | *9866 | 7876 | 0.7818 |
| 2.6 | 13.4638 | .0743 | 6.7690 | 6.6947 | -9890 | *8305 | 0.8257 |
| 2.7 | 14 8797 | :0672 | 7.4735 | 7.4063 | 9910 | *8735 | 0.8696 |
| 2.8 | 16.4446 | *0608 | 8.2527 | 8.1919 | 9926 | 9166 | 0.9134 |
| 2.9 | 18.1741 | .0550 | 9.1146 | 9.0596 | *9940 | 9597 | 0.9571 |
| 3.0 | 20.0855 | .0498 | 10.068 | 10.018 | 9951 | 1.0029 | 1.0008 |
| 0.1 | 02.7000 | .0450 | 11.122 | 11.050 | -0050 | 1.0400 | 7.0444 |
| 3.1 | 22.1980 | | | 11.076 | *9959 | 1.0462 | 1.0444 |
| 3.5 | 24.5325 | *0408 | 12.287 | 12.246 | •9967 | 1.0894 | 1.0880 |
| 3.3 | 27.1126 | .0369 | 13.575 | 13.538 | •9973 | 1.1327 | 1.1316 |
| 3.4 | 29.9641 | '0334 | 14.999 | 14.965 | 9978 | 1.1761 | 1.1751 |
| 3.2 | 33.1155 | *0302 | 16.573 | 16.543 | 9982 | 1 2194 | 1.2186 |
| 3.6 | 36.5982 | .0273 | 18:313 | 18:285 | 9985 | 1.2628 | 1.2621 |
| 3.7 | 40.4473 | .0247 | 20.236 | 20.511 | 9988 | 1.3061 | 1.3056 |
| 3.8 | 44.7012 | 0224 | 22.362 | 22:339 | 9990 | 1.3495 | 1.3491 |
| 3.9 | | 0202 | 24:711 | | | | 1.3925 |
| | 49.4024 | | | 24.691 | 19992 | 1 3929 | |
| 4.0 | 54.5982 | .0183 | 27:308 | 27:190 | •9993 | 1.4363 | 1.4360 |
| 4.1 | 60.3403 | *0166 | 30.178 | 30.162 | -9995 | 1.4797 | 1.4795 |
| 4.2 | 66.6863 | .0150 | 33.351 | 33.336 | -9996 | 1.5231 | 1.5229 |
| 4.3 | 73.6998 | •0136 | 36.857 | 36.843 | 19996 | 1.5665 | 1.5664 |
| 4.4 | 81.4509 | .0123 | 40.732 | 40.719 | 9997 | 1.6099 | 1.6098 |
| 4.5 | 90.0171 | .0111 | 45.014 | 45.003 | 9997 | 1.6533 | 1.6532 |
| 4.6 | 99.4843 | .0101 | 49.747 | 49.737 | -9998 | 1.6968 | 1.6967 |
| 4.7 | | *0091 | 54.978 | 54.969 | | | |
| | 109.9472 | | | | *9998 | 1.7402 | 1.7401 |
| 4.8 | 121.5104 | .0082 | 60.759 | 60.751 | .9999 | 1.7836 | 1.7836 |
| 4·9 5·0 | 134.2898 | .0074 | 67.149 | 67:141 | *9999 | 1.8270 | 1.8270 |
| | 148.4132 | -0067 | 74.210 | 74.203 | *9999 | 1.8705 | 1.8704 |

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